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Acronyms

- ACM, Asbestos Containing Materials
- AHERA, Asbestos Hazard Emergency Response Act
- AST, Above-ground Storage Tank
- ASTM, American Society for Testing and Materials
- BGS, Beneath Ground Surface
- BNSF, Burlington Northern Santa Fe
- BTEX, Benzene, Toluene, Ethyl Benzene, Xylene
- CAA, Clean Air Act
- CERCLA, Comprehensive Environmental Response Compensation and Liability Act
- DOT, United States Department of Transportation
- DSI, Detailed Site Investigation
- EAO, Environmental Affairs Office
- EDR, Environmental Data Research, Inc.
- EIS, Environmental Impact Statement
- EPA, Environmental Protection Agency
- ESA, Endangered Species Act
- FAST, Freight Action Strategy for Seattle - Tacoma
- FHWA, Federal Highway Administration
- GSP, General Special Provision
- LBP, Lead Based Paint
- MTBE, Methyl Tertiary-Butyl Ether
- MTCA, Model Toxics Control Act
- NESHAP, National Emission Standards for Hazardous Air Pollutants
- NB, Northbound
- NPDES, National Pollutant Discharge Elimination System
- NPL, National Priority List (Superfund)
- PAH, Polycyclic Aromatic Hydrocarbons
- PCB, Polychlorinated biphenyls
- PEL, Permissible Exposure Limit
- POTW, Publicly Owned Treatment Works
- PPE, Personal Protective Equipment
- PSCAA, Puget Sound Clean Air Agency
- PSI, Preliminary Site Investigation
- PVC, Polyvinyl chloride
- RCW, Revised Code of Washington
- ROW, Right of Way
- SB, Southbound
- SIP, State Implementation Plan
- SPCC Plan, Spill Prevention Control and Countermeasures Plan

- TCLP, Toxicity Characteristic Leaching Procedure
- TPCHD, Tacoma – Pierce County Health Department
- TPH, Total Petroleum Hydrocarbons
- TPS, TPS Technologies - Soil Recyclers of Washington
- USG, United States Gypsum
- WAC, Washington Administrative Code
- WSDOT, Washington State Department of Transportation
- UST, Underground Storage Tank
- VOC, Volatile Organic Carbon

EXECUTIVE SUMMARY

This report presents information on potential environmental concerns related to properties affected by Washington State Department of Transportation's (WSDOT) construction of an improved system continuity between the current terminus of SR 167 and Interstate 5 (I-5) (See Figure1). The project footprint extends from Puyallup to Tacoma in Pierce County, Washington. A new corridor and freeway were selected as the preferred alternative as a result of completing a transportation Major Investment Study and a Tier I Environmental Impact Statement (EIS). To focus analysis on properties that could affect the highway design, acquisition, or construction, a site screening process was developed and implemented to identify properties with known or suspected environmental issues. Efforts included historical research on industrial and commercial land use, regulatory agency database list and file reviews, and a windshield survey of the properties slated for acquisition.

In total, 188 sites were included in the initial screening process. Of those 188 sites, 159 were eliminated from further consideration because they were either located downgradient, too far away from the planned right of way (ROW), or did not pose significant potential for environmental or construction risks. The 29 sites retained for detailed analysis include:

- ***Commencement Bay, Nearshore/Tideflats Superfund Site*** - a Superfund site in Tacoma that consists of four separate Project Areas currently undergoing cleanup for sediments, groundwater, and soil;

- ***Olympic Pipe Line*** - a pipeline that carries diesel, jet fuel, and gasoline from Anacortes to customers throughout Western Washington;

- ***B&L Woodwaste*** - a capped industrial landfill site with arsenic contamination in both the soil and groundwater;

- ***United States Gypsum (USG) Company Highway 99 Site*** - a historic dump site for copper slag that now has arsenic contaminated groundwater;

- ***Rick Sexton Drums*** - a property with unidentified materials and possible asbestos containing materials located on site;

- ***Commercial Sales, Inc.*** - a commercial company that sells various machinery parts and equipment;

- ***Coast Engine and Equipment Co***. - a large quantity generator of numerous wastes due to train maintenance activities on site;

- ***Firwood Gym*** - a property that contains numerous unidentified items and possible asbestos containing materials and lead based paint;

- ***Valley Avenue Residences*** – a series of property plots with containers of unidentified materials on site;

- ***Jesse Engineering*** - a metal fabrication company with unidentified drums of materials on site;

- ***Firwood Grocery*** - a property with known petroleum contamination in the soil and groundwater;

- ***SR 167/20E Steel Bridge*** - a WSDOT bridge constructed in 1925 that is covered with lead based paint;

- ***All State Industrial and Marine*** - a company with multiple chemical and fueling containers on site;

- ***Specialized Transport Service*** - a company that stores and maintains a fleet of semi-trucks and trailers;

- ***Vitamilk Dairy – Fife*** - an operational dairy that previously had two USTs on site;

- ***Richard Johnson Property*** – a vacant property that may contain two old USTs that were previously closed in place;

- ***Milgard Tempering*** - a small quantity generator with previous violations;

- ***S&J Trucking*** - a commercial transporter of hazardous waste;

- ***Don Olson Construction*** - a leaking underground storage tank site with petroleum contamination;

- ***Portac, Inc.*** - a small quantity generator with two USTs previously on site;

- ***North American Crane and Equipment Co.,*** - a large quantity generator likely due to operation and maintenance activities on site;

- ***Arco 5898*** – an operational gasoline station immediately adjacent to the project footprint;

- ***BP #11073*** – a gasoline station with petroleum contaminated groundwater;

- ***CAC Inc. 97135*** – a Chevron gasoline station with petroleum contaminated groundwater and soil;

- ***Tosco #03139-30137*** – a BP gasoline station with petroleum contaminated groundwater and soil;

- ***Unocal 4836*** – a former gasoline station with petroleum contaminated groundwater and soil that has migrated off site;

- ***Auto Warehousing Company***- a leaking underground storage tank site with soil and groundwater contamination;

- ***H&H Diesel*** – a leaking underground storage tank site with soil and groundwater contamination;

- ***Texaco Station*** – a leaking underground storage tank site with soil and groundwater contamination.

The first four sites listed above are considered to be substantially contaminated properties, with the remaining twenty-five sites considered to be reasonably predictable properties. Substantially contaminated properties are typically large or have large volumes of contaminated materials, have a long history of industrial or commercial land use, and the contaminants are persistent or difficult and expensive to manage. Reasonably predictable sites are properties where recognized environmental conditions are known based on existing data; or can be predicted based on site observations, previous experience in similar situations, or by using best professional judgement. These sites are typically small, the contaminants are localized and are relatively non-toxic, or abatement/remediation activities are routine (e.g., asbestos abatement or petroleum hydrocarbon contaminated soil remediation).

Several impacts relative to contaminated media are a potential for this project. Contaminated soil is expected at most of the substantially contaminated sites and many of the reasonably predictable properties. Depending upon the structures selected to support bridges and overpasses and other necessary structures, it is also possible for contaminated groundwater to be encountered along the project footprint. Examples of expected soil and groundwater contaminants include petroleum products, metals, and volatile organics. Surface water impacts are not anticipated; however, soil erosion and other uncontrolled releases that may occur during construction could negatively impact surface waters. Impacts associated with building materials that contain regulated substances are also a potential concern within the planned ROW, including asbestos containing materials and lead based paint.

Estimated costs for mitigation measures are included within the report. A total estimated cost for preliminary investigations and remedial construction is not included due to unavailability of specific design information. Unit cost estimates are provided for each of the suspected impacts that may affect WSDOT's liability, worker safety, and construction activities. The estimates are based on preliminary design, environmental data, and site information gathered during windshield surveys.

Mitigation measures include preparing a contaminated media contingency plan that provides specific guidance for managing contaminated media. The contaminated media contingency plan should address risk-based cleanup and recommend provisions for field screening options, notification requirements, and soil stockpile management. Groundwater mitigation measures include alternatives for construction activities which minimize or avoid intercepting the groundwater table if possible. Surface water mitigation measures are addressed by way of a Spill Prevention Control and Countermeasure (SPCC) plan. Mitigation measures for demolition debris rely heavily on recycling. Possible impacts related to federal and state Superfund authorities within the project area should be mitigated through early coordination with the Environmental Protection Agency (EPA) and Washington State Department of Ecology, respectively.

1.0 INTRODUCTION

1.1 Project Description

The purpose of the proposed project is to improve regional mobility of the transportation system between the existing Puyallup termini of SR 167 and the I-5 corridor, to the new SR 509 freeway and the Port of Tacoma. This facility will serve multimodal local and port freight movement and passenger movement while balancing environmental needs. The project is intended to reduce congestion and improve safety on the arterials and intersections in the study area; provide improved system continuity between the SR 167 corridor and I-5; and maintain or improve air quality in the corridor to ensure compliance with the current State Implementation Plan (SIP) and requirements of the Clean Air Act (CAA).

The project's purpose will be achieved by construction of a freeway facility between the Puyallup termini and the I-5 corridor. A corridor and freeway were selected as the preferred alternative as a result of completing a transportation Major Investment Study and a Tier I Environmental Impact Statement (EIS). Several corridor alternatives and a no action alternative were evaluated in the Tier I EIS. The preferred alternative, Corridor 2, provided a corridor within which a new limited access freeway connected SR 509 to SR 167 near Puyallup and interchanges at SR 5 and Valley Avenue could be configured.

The Tier II EIS proposes two alternatives, a no action and a build alternative. The build alternative would configure a four-lane freeway as presented in the Tier I EIS within the corridor selected as the preferred alternative in Tier I. The build alternative includes freeway-to-freeway connections with SR 509 to the north, SR 167 to the south, SR 5, and new interchanges at 54th Avenue East and Valley Avenue. Design options have been developed (for evaluation) at each interchange except for the SR 509 and I-5 freeway-to-freeway connections.

There are a number of problems associated with the existing non-freeway segment of SR 167 between the terminus of the freeway segment in the Puyallup area and the I-5 corridor/Port of Tacoma/Fife area. The non-freeway segment, which is an incomplete part of the north Pierce County freeway system as planned, is on surface streets and includes a circuitous route through Puyallup via Meridian Street and River Road, and a major truck route through Fife via Valley Avenue and 54th Avenue East. Several intersections along these routes operate at over-capacity conditions during peak periods resulting in traffic backups and delays. Two intersections (54th Avenue East with 20th Street East and 54th Avenue East with Pacific Highway [SR 99]) have been improved by

better synchronization of signals and adding lane channelization. However, they still operate at near- to over-capacity conditions.

Accident ratios, on the non-freeway segment of SR 167, are 20 to 70 percent higher than statewide averages for similar highways. The high levels of congestion at intersections and the frequency of intersecting driveways contribute to these higher ratios. Truck use in residential areas and inadequate intersection geometry exacerbate the safety problem. Traffic projections for the year 2020 indicate the capacity problems at intersections would increase if actions to complete this corridor are not taken.

Additional problems include local streets and arterials being used to transport freight to and from the Port of Tacoma, the Green River Valley, and I-90. The Port of Tacoma projects truck traffic, to and from the Port, to double from 300,000 to 600,000 trucks per year by the year 2014. Anticipated problems include more congestion-related delays in freight transport; incompatibility of heavy truck use on residential surface streets creating unsafe conditions; and existing steep grades on Highway 18 from I-5 to I-90. Based on these projections, need for the project has increased since the Tier I EIS was conducted. A detailed description of the proposed mainline and each interchange design option follows below.

1.2 Mainline Description

The initial mainline configuration was developed from information contained in the Tier I EIS with slight modifications to meet roadway design standards. Additionally, the roadway was shifted away from Hylebos Creek in the area north of I-5 to minimize proximity impacts and provide maximum buffer space. See Figure 1 for Project Location and Vicinity Map.

The proposed alignment for the mainline roadway begins with a freeway-to-freeway connection to SR 509 in the vicinity of 8th Street East. The mainline alignment continues southwesterly on an embankment until it crosses 54th Avenue East in the vicinity of 8th Street East. An interchange providing access to and from the east is proposed at 54th Avenue. Two design options for this interchange are described below. The mainline continues raised on structure over 54th Avenue, 8th Street East, and 12th Street East, parallel to Hylebos Creek until the freeway-to-freeway connection with I-5. Due to the complexity of the interchange at this location, only one option could be developed to meet design criteria. The mainline continues on structure to a touchdown point in the vicinity of 70th Avenue. From this point, the mainline continues on embankment to a proposed interchange with Valley Avenue. Three design options are presented below for this interchange. With each design option, a structure would carry the mainline over Wapato Creek before touching down to grade on a raised embankment. The mainline continues on to the southeast parallel with Valley Avenue. Freeway truck weigh station facilities are proposed for each direction of travel in the vicinity of the Puyallup Recreation Center. The mainline continues towards its terminus at the existing SR

161/SR 167 interchange. Three design options have also been developed for consideration at this interchange.

1.3 Interchange Descriptions

Following are descriptions of the design features for each of the interchange options.

1.3.1 SR 509/SR 167 Connection

SR 167 connects to the existing SR 509 at the Port of Tacoma Road/SR 509 Interchange. The location of the connection and design features are dictated by the location of SR 509 and the SR 167 alignment as approved by the Tier I EIS. Single lane ramp connections will be provided from SR 167 southbound to SR 509 westbound and from SR 509 eastbound to SR 167 northbound.

54th Avenue Partial Interchange
There are two options for the partial interchange at this location. The ramps for each option are all single lane ramps.

- **Loop Ramp Option**

  This option provides a southbound diamond off ramp and a northbound loop on ramp. The off ramp leaves SR 167 while elevated then descends and connects with 54th Avenue East at grade approximately 600 feet north of 8th Street East. The loop on ramp starts from 54th Avenue East, crosses 8th Street East at grade, and ascends to the elevated mainline.

- **Half Diamond Option**

  This option provides for a southbound diamond off ramp at the same location as the loop ramp option. The northbound on ramp would be a diamond ramp that departs from 8th Street East (approximately 1000 feet east of 54th Avenue East) at grade and then begins to ascend eventually matching into the elevated SR 167.

1.3.2 Interstate 5 Interchange

Due to the complexity of this interchange and limited solutions for the freeway-to-freeway connections, only one design option could be developed to reasonably meet the needs of this location. The interchange will consist of three elevated levels of roadway structures extending some 80 feet above the ground surface. The SR 167 mainline will be elevated over 62nd Avenue East, 12th Street East, Pacific Highway (SR 99), Interstate 5, 20th Street East, and 70th Avenue East.

This interchange will provide all freeway connections except the following two movements that are not required due to low traffic volume:

- Connection from northbound SR 167 to southbound I-5; and
- Connection from northbound I-5 to southbound SR 167.

The HOV direct access ramps will be provided for only the following movements: Southbound (SB) I-5 to northbound (NB) SR 167, NB I-5 to NB SR 167, SB SR 167 to NB I-5 and SB SR 167 to SB I-5.

I-5 will be widened between approximately the 54th Avenue interchange and the proposed SR 167 crossing. A collector-distributor (C-D) road will be provided for the northbound I-5 off ramp.

Realignment of 20th Street East and 70th Avenue East is required to allow 20th Street East to remain at grade through the interchange. Realigned 70th Avenue East remains at grade underneath the NB C-D road to NB SR 167, and then elevates to pass over realigned 20th Street East and I-5, and finally descends to pass underneath the SB I-5 to SB SR 167 ramp. 70th Avenue East intersects SR 99 at grade. The intersection of 20th Street East and 70th Avenue East is relocated.

On Interstate 5, there are four existing bridges over Hylebos Creek (bridge numbers 5/462E, 5/462W, 5/464E, 5/464W) that will require widening to accommodate the interchange design.

1.3.3 Valley Avenue Interchange

Three design options were developed for this interchange location. For each, the SR 167 mainline will be elevated over Valley Avenue, Union Pacific Railroad, Wapato Creek, and Freeman Road.

- **Freeman Road Option**

  In this option, a northbound off ramp leaves SR 167 at grade and remains at grade until it matches into Valley Avenue. A northbound on ramp leaves Valley Avenue at grade then elevates to go over the railroad and connects to the elevated SR 167 mainline. Both of the ramps in this option will be single lane ramps.

  The southbound off ramp leaves SR 167 while elevated and passes over the railroad and Valley Avenue. The ramp then begins to descend and enters a right hand curve to Freeman Road. It then matches the existing grade at Freeman Road. The southbound on ramp leaves Freeman Road, matching at grade. The ramp stays at grade until it matches onto SR 167. Both the ramps will be a single lane ramp.

  Freeman Road would be widened from the on/off ramp connections to Valley Avenue, while maintaining the existing grade. South of Valley Avenue, Freeman

Road would be realigned to improve the intersection angle with Valley Avenue and the at-grade railroad crossing.

- **Valley Avenue Option**

In this option, the configuration for the northbound off and on ramps remains the same as the previous option. The southbound off ramp leaves SR 167 while elevated and passes over Valley Avenue. The ramp then begins to descend, enters a right hand loop back to Valley Avenue where it matches at existing grade. The southbound on ramp leaves Valley Avenue matching at grade until it connects to the SR 167 mainline. All of the ramps included in this option will be single lane ramps.

- **Valley Avenue Realignment Option**

In this option, the configuration for the northbound off and on ramp is the same as the Freeman Road connection option. The southbound off ramp leaves SR 167 while elevated and passes over the railroad. The ramp then begins to descend where it matches the existing grade on the realigned Valley Avenue. The southbound on ramp leaves realigned Valley Avenue matching at grade. The ramp will remain at grade until it matches with SR 167. All of the NB and SB ramps will be single lane ramps.

At the west end, Valley Avenue will begin realignment to the north at the NB on/off ramp termini. The road will stay at grade for the length of the realignment. Valley Avenue will match the original alignment of the existing railroad over-crossing east of the project. A short section of Freeman Road must be realigned to attain the proper intersection angle with the realigned five-lane Valley Avenue roadway.

Two sections of the existing Valley Avenue will be removed for this option. One of the portions to be removed is under the footprint of SR 167, and the second is at the crossing of Wapato Creek and Valley Avenue. Cul-de-sacs will be placed at the ends of the remaining sections of Valley Avenue to maintain access to homes and businesses.

1.3.4 SR 161/SR 167 Interchange

This is the southern terminus of the proposed SR 167 extension. An existing interchange provides the southern terminus of SR 167. Three design options have been developed for this interchange. In each design option, the SR 167 mainline will be elevated over SR 161 (Meridian Street East).

- **Urban Interchange Option**

The northbound off ramp leaves elevated SR 167 at grade and matches into SR 161. The single lane off ramp will widen to one northbound lane and two southbound lanes at SR 161. The southbound on ramp leaves SR 161 at grade matching into elevated SR 167. The two lane on ramp will merge into one lane.

The southbound off ramp leaves SR 167 at grade and matches into SR 161. The single lane off ramp will widen to one northbound lane and two southbound lanes at SR 161. The southbound on ramp leaves SR 161 at grade, matching into elevated SR 167. The two lane on ramp will merge to one lane.

SR 512 Off Ramp: The SR 512 off ramp, a single lane ramp, exits SR 167 east of the SR 161 over-crossing. The SR 512 off ramp then crosses over the SR 167 NB on ramp before merging into SR 512.

North Levee Road: North Levee Road will end in a cul-de-sac approximately 400 – 500 feet west of SR 161. The existing access road under the Puyallup River Bridge will remain to allow access to the storage facility in the southeast quadrant of the SR 167/SR 161 interchange. Existing connections from North Levee Road and the access road with SR 161 will be eliminated.

Puyallup River Bridge: The existing steel bridge over the Puyallup River (NB SR 161) will be removed. The existing concrete bridge (SB SR 161) will be widened or a new structure will be constructed over the river.

North Levee Road/Valley Avenue Cross Connection: This connection will include a new two-lane roadway connecting North Levee Road and Valley Avenue. This cross connection will facilitate traffic movements eliminated by the new interchange at the east terminus of North Levee Road. SR 167 will be on a structure located over the cross connection.

- **Low Diamond Option**

The northbound off ramp leaves elevated SR 167 and stays at grade until it matches into North Levee Road. The single lane off ramp will widen to two eastbound lanes and one westbound lane at North Levee Road. The northbound on ramp leaves SR 161 at grade and then stays on grade until matching into SR 167. The two-lane ramp curves around the existing storage facility office building in the southeast quadrant of the SR 167/SR 161 interchange.

The southbound off ramp leaves SR 167 at grade and matches into SR 161. The single lane off ramp will widen to two southbound lanes and one northbound lane at SR 161. The southbound on ramp leaves SR 161 at grade and remains at grade until it matches into SR 167. A two lane on ramp will merge to one lane.

SR 512 Off Ramp and Puyallup River Bridge: The options for the SR 512 off ramp and the Puyallup River bridges are the same as the Urban Interchange Option.

North Levee Road: North Levee Road will be widened to the east and west of the northbound off ramp terminus. North Levee Road will terminate at its present location at SR 161 with a one-lane connection to both northbound and southbound SR 161. The existing access road under the Puyallup River bridges will remain for access to the storage facility in the southeast quadrant of the SR 167/SR 161 interchange. This access road will terminate in a cul-de-sac at the storage facility entrance. No access to the SR 167 on ramp will be allowed.

- **Medium Diamond Option**

There is only one noticeable difference between the Low Diamond and Medium Diamond options. The northbound on ramp in the Medium Diamond option has a smoother curve and will impact the existing office building at the storage facility located in the southeast quadrant of the SR 167/SR 161 interchange.

1.4 Discipline Study Overview

The purpose of this study is to identify and assess the potential for encountering environmental contaminants on properties that could increase construction costs or represent an environmental liability to WSDOT. The information will allow design engineers to anticipate conditions and to factor the potential need to address hazardous materials into project development decisions. Sites that require a degree of consideration include:

- Locations within the proposed ROW where contaminants in soil or groundwater could affect design or the cost of construction, including adjacent or hydrologically upgradient properties with a potential to affect construction activity; and

- Properties currently considered for acquisition with conditions that, while not increasing construction costs, could represent an environmental liability for WSDOT.

The goals of the study are to:

- Identify historical and existing property uses within the proposed ROW that have a known or probable contaminant release, including sites with a potential for significant contamination;

- Identify adjacent property uses that may affect water quality within the project construction zone (e.g., migrating groundwater or surface water);

- Identify where relatively common or predictable contaminants are likely to occur (e.g., asbestos and lead based paints in structures);

- Estimate the unit cost of potential site cleanups associated with proposed construction activities based on available information and best professional judgment;

- Provide mitigation options for areas with a high probability for encountering contamination during construction; and

- Identify the location of areas that warrant additional investigation to further characterize potential impacts, and provide recommendations and estimated unit costs for addressing data gaps.

This discipline study is divided into seven sections. Section 1.0 provides an overview of the SR 167 project, the alternatives for all of the possible interchange options along SR 167, and the hazardous materials discipline study. Site screening methods, including historical research, the regulatory agency list, and file reviews are presented in Section 2.0. The physical setting of the study area, along with a summary of known or suspected contaminated properties, is presented in Section 3.0. Anticipated environmental impacts, including cumulative and operational, and the associated remedial costs for prospective acquisition properties and construction areas are presented in Section 4.0. Mitigation measures to avoid, minimize, or control contamination are discussed in Section 5.0. A bibliography list of references is presented in Section 6.0. The overall limitations of this work are summarized in Section 7.0.

Table 1 and Table 2 include the specific sites within the proposed project footprint that are considered to be either substantially contaminated or reasonably predictable properties. Recommendations for site investigations are listed in Table 3, and the associated costs for those investigations are included in Table 4. Table 5 lists the sites that may contain ACM/LBP and also provides an estimate for the sampling and abatement of those properties.

Figure 1 includes a map of the project location and surrounding vicinity. Figure 2 includes the maps detailing the different interchange options for SR 167. Figure 3 is a site map with identification numbers corresponding to the 29 sites of concern. Photographs of the 29 sites of concern are located within Figure 4.

Appendix A includes the environmental database research conducted by Environmental Data Resources, Inc. The Hazardous Materials Site Screening Summary, in Appendix B, includes all of the initial sites screened within a mile radius of the project footprint. An example of Form 2, Notification of Dangerous Waste Activities is included within Appendix C. Appendix D provides an example of a contaminated soil disposal specification. Appendix E contains General Special Provision #071502.FR1 that requires a Spill Prevention Control and Countermeasure Plan for WSDOT projects. Appendix F

includes construction specifications addressing asbestos containing materials and lead based paint.

2.0 STUDIES AND COORDINATION

This section of the study describes the methods of sequencing used to identify potentially contaminated properties that may affect ROW plans.

2.1 Study Methodology

The overall study area includes properties both within and outside of the proposed ROW that have a potential to affect acquisition decisions and construction activities. The search radius consisted of all sites within a one-mile radius of the proposed project footprint. The study was accomplished by performing the following sequential tasks:

- Identify available local, state, and federal databases to identify potential contamination sources that could impact the project site;

- Review publicly available records at local environmental agencies, as necessary, to obtain supplemental information regarding present and past environmental conditions and incidents at the project site and properties within the study area that, if contaminated, could impact the site;

- Interpret the history of the project site using available aerial photographs and other historic information sources;

- Interview persons knowledgeable of the project site and specific sites of concern;

- Review available geologic literature and topographic maps to determine surface drainage paths as well as groundwater depth and flow direction below the study area;

- Conduct windshield surveys of sites within the project footprint to observe site features and potential contamination sources which may impact the project site;

- Screen all sites based on their location relative to prospective ROW construction areas as well as on additional site-specific environmental data available in regulatory agency files. The initial screening process focused the study on conditions that represent a potential to significantly affect the ROW expansion project, including highway design, acquisition, or construction;

- Summarize environmental conditions at the primary known or suspected contaminated sites within the expanded ROW area;

- Evaluate potential impacts that known or suspected contamination may have on project development, including property acquisition and construction activities and costs; and

- Identify potential measures and options to mitigate potential impacts of hazardous substances to the proposed project.

2.2 Regulatory Database Review

A regulatory data search was conducted consistent with American Society for Testing and Materials (ASTM), WSDOT and Federal Highway Administration (FHWA) standards and guidance. Environmental Data Research, Inc. (EDR) was contracted to provide a comprehensive search of existing environmental regulatory agency databases for known or suspected environmental concerns within the study area. The EDR report includes a list of databases searched, a statistical profile indicating the number of properties within the study area, selected detailed information from federal and state lists, and maps illustrating the identifiable and mappable sites within the indicated search radius. Mappable sites are located on focus maps provided by EDR. See Appendix A for the full database list and results of the EDR database research.

2.3 Historical Research

To identify potential sites of concern not included in the EDR report, available information was reviewed to identify historical sites with potential environmental concerns. Historical research efforts were directed toward developing an understanding of the types of industries which existed within the study area, chemicals of concern associated with these industries, and potential waste streams.

An inventory of historical land use was compiled using WSDOT aerial photographs (i.e., 1951,1955 -1956, 1978, 1997), Sanborn Fire Insurance maps, and Tacoma Vicinity Polk Directories from 1950 to 2000 for the alternative corridor. The purpose of this review was to characterize land use activities within the project area over the past 50 years.

2.4 Data Validation

Based on the results of the EDR report and historical background analysis, files were requested from the Environmental Protection Agency (EPA), the Washington State Department of Ecology, and the Tacoma Pierce County Health Department (TPCHD). The focus of the review was to identify the nature and extent of known contamination, completed remedial activities (if any), and the effect the sites may have on environmental conditions within the planned ROW.

A drive-by reconnaissance of the study area was also conducted. The windshield surveys focused on sites with known or suspected environmental concerns that could potentially

affect acquisition or construction decisions. All properties being considered by WSDOT for ROW acquisition were included in this effort. The windshield surveys were limited to features readily observed from public access corridors and did not include entering or viewing conditions within buildings. Information regarding the following concerns was recorded in field notes:

- The presence of improvements on site;
- The location, topography, and usage of open areas;
- Indications that suggest the presence of underground storage tanks (USTs) and above-ground storage tanks (ASTs), including observable patches on asphalt or concrete;
- Indications of buried pipelines, drums, hazardous and solid waste disposal, soil staining, and distressed vegetation;
- Suspected asbestos-containing material (ACM) and lead-based paint (LBP) issues;
- General housekeeping observations;
- Adjacent and nearby properties with a potential to contribute to on site contamination.

In addition to considering the information and applying the methodology described above, the physical setting of the study area was considered including slope, soils, drainage features (natural or otherwise), depth to groundwater, and the rate and direction of groundwater flow. Topographic, geologic, and groundwater occurrence maps were reviewed to evaluate migration potential for released contaminants as related to site location.

Similar criteria were applied to evaluate proposed acquisition parcels. For these properties, WSDOT's Environmental Affairs Office (EAO) examined the probable nature and extent of contamination related to past and current operations to assess the potential for inheriting environmental liabilities. Sites located outside of the planned ROW were also reviewed based on the potential for contaminant migration.

The evaluation considered available design information. Sites were subjected to detailed analysis if the following considerations occurred:

- The site was a potential ROW acquisition within the footprint of the preferred alternative and contained possible or known soil and/or water contamination;
- The site was located hydraulically upgradient from the construction area and had the potential to release groundwater contaminants which could be encountered during construction within the ROW;

- The site was topographically upstream from the construction area and was a potential surface drainage pathway for contaminants to the ROW;

- The site may be considered a source of fill material for the project.

2.5 Site Screening Summary

The study area encompassed a one-mile radius area around the project footprint including several past and present industrial and commercial properties. In total, 188 sites were included in the initial site screening process. Of the 188 sites, 159 sites were eliminated from further consideration because they were either 1) Located downgradient of or too far away from the planned ROW and/or 2) There were no environmental concerns that may affect planned ROW expansion. See Appendix B for the SR 167 Hazardous Materials Site Screening Summary.

Of the 29 sites retained for in-depth analysis, EAO evaluated the probable extent of contamination, in relation to applicable remedial approaches, to consider whether remediation on the site could be "reasonably predictable" or "substantially contaminated." Reasonably predictable sites are sites where recognized environmental conditions are known based on existing data or can be predicted based on site observations, previous experience in similar situations, or by using best professional judgment. These sites are typically small, the contaminants are localized and are relatively non-toxic, and abatement/remediation activities are routine (e.g., asbestos abatement or petroleum hydrocarbon-contaminated soil remediation). Substantially contaminated sites are typically large or have large volumes of contaminated materials, have a long history of industrial or commercial land use, and the contaminants are persistent, difficult or expensive to manage. There may be a considerable amount of environmental data available for substantially contaminated sites; however, the cost liability associated with these sites can be prohibitive. As discussed below, 4 of the 29 sites are substantially contaminated (Table 1) and the remaining 25 sites are reasonably predictable (Table 2). See Appendix B for the Hazardous Materials Site Screening Summary and Figure 4 for Site Photographs. An identification number is assigned to each specific site that correlates with the site map located in Figure 3.

Table 1 Substantially Contaminated Properties

Map ID Number	Site	Address	Rationale
1	Commencement Bay/Nearshore, Tideflats Superfund	Commencement Bay/Nearshore, Tideflats	Project areas contain heavy industry such as aluminum processing, chemical, pulp and paper, and primary smelting contamination
2	Olympic Pipe Line	Follows I-5 closely from Puyallup River to SR 18	Jet fuel, diesel, gasoline running through the pipe line 24 hours/day
3	B&L Woodwaste	Milton Way	Arsenic contamination/other wastes
4	USG 99 Site	SR 99/I-5	Arsenic contamination

Table 2 Reasonably Predictable Properties

Map ID Number	Site	Address	Rationale
5	Rick Sexton Drums	6716 Pacific Hwy East	Age of building; possible asbestos/lead contamination; items on site
6	Commercial Sales Inc.	6411 Pacific Hwy East	Miscellaneous parts, tanks, and equipment on site
7	Coast Engine & Equipment	4012 SR 509, S. Frontage	Monthly generator of numerous wastes; train cleaning on site
8	Firwood Gym	4312 Freeman Rd.	Miscellaneous storage of abandoned items on site
9	Valley Avenue Residences	Intersection of Valley Avenue and 78th Ave E.	Greenhouses with miscellaneous chemicals on site
10	Jesse Engineering	5225 7th St. E.	Various chemical containers outside; spill visible; machine manufacturer
11	Firwood Grocery	8124 Valley Ave.	Petroleum contamination; suspected UST(s); possible ACM and LBP
12	SR 167/20E Steel Bridge	Meridian Street in Puyallup	Lead based paint on the structure
13	All State Industrial and Marine	5112 85th Ave E., Building A	Miscellaneous unidentified containers stored on site; AST
14	Specialized Transport Service	5112 85th Ave E., Building C	Surficial staining; maintenance activities occurring on site
15	Vitamilk Dairy - Fife	6527 Pacific Highway	Two USTs previously on site, possible asbestos within improvement
16	Richard Johnson property	6708 Pacific Highway	Two USTs may remain on site

17	Milgard Tempering	910 54th Avenue	Previous violation as small quantity generator
18	S&J Trucking	7823 Valley Avenue	Transporter of hazardous waste
19	Don Olson Construction	4407 Freeman Road	Soil contamination due to leaking UST
20	Portac, Inc.	4215 East West Road (SR 509)	Previous UST site, small quantity generator
21	North American Crane and Equipment Co.	405 Porter Way	Large quantity generator; indication of crane maintenance activities on site
22	Arco 5898	102 Valley Ave NE	USTs on site immediately adjacent to project footprint
23	BP (Tosco) #11073	5405 Pacific Highway E	Groundwater contamination
24	CAC Inc. 97135	5319 20th St. E	Contaminated groundwater and soil previously on site
25	Tosco #03139-30137	2002 54th Ave E	Contaminated groundwater and soil on site
26	Unocal 4836	2001 54th Ave E	Contaminated groundwater and soil migrated off site
27	Auto Warehousing Co.	3715 East-West Rd.	Contaminated groundwater and soil due to leaking underground storage tank
28	H&H Diesel	405 Porter Way	Contaminated groundwater and soil due to leaking underground storage tank
29	Texaco Station	5501 20th Street E	Contaminated groundwater and soil due to leaking underground storage tank

3.0 AFFECTED ENVIRONMENT

This section of the report provides a characterization of the affected environment for sites thought to have a reasonable potential for encountering contaminants. First, an overview of the study area's land use history is presented, followed by a discussion of the physical environment. Known and suspected environmental concerns of the 29 sites listed are then summarized. The site summaries combine the historical, regulatory, and site survey findings into a short narrative for each site.

3.1 Historical Overview

Land use in the area between I-5 and the current terminus of SR 167 at Meridian Road is historically agricultural. Independent farmers appear to have made up the majority of the agriculture community. Aerial photographs from 1978 indicate the area was indeed all farmland, with the exception of a few small residential clusters. The Puyallup River Valley has become more industrialized over the last decade with industrial warehouses replacing farmland. The number of residential improvements in the area has also increased as more jobs are created within this new industrial setting.

In contrast, the land use in the area between I-5 and the current intersection of SR 509 and 54th Avenue East has historically been commercial/industrial with a small amount of agriculture. In the past two decades, the growth of industrial and commercial businesses has increased, along with the population of people living within the surrounding area. The number of residential properties is also growing, but at a slower rate than the industrial property development.

3.2 Physical Environment

The study area is located within the Puyallup River Valley and includes parts of Commencement Bay. The land surface within this area is made up of nearly level to rolling, moderately well drained and somewhat excessively drained soils that formed in glacial till and glacial outwash. The annual precipitation is 0.8 to 1.3m (35 to 50 inches), and the mean annual air temperature is about 50 degrees F.

Elevation of the land surface within the Puyallup River Valley varies from near sea level to 100 feet. Slopes are less than 2 percent, and the surface is smooth. Soils within the project footprint consist of alluvial sands, silts, silty sands and sandy silts. The Soil Survey for Pierce County indicates that the surface layer of the soil throughout the project footprint is typically dark grayish brown silt loam about 14 inches thick. The underlying material, to a depth of 40 inches beneath ground surface (bgs), is mottled, brown silt loam

and dark yellowish brown very fine sandy loam. To a depth of more than 60 inches, the soil is mottled, dark gray fine sandy loam, gray silty clay loam, very dark grayish brown fine sand, and dark yellowish brown loam.

Specific soil information gained from WSDOT soil borings indicates that the soil profile in the northwest section of the project consists of a persistent loose sandy silt layer at the surface that varies in thickness from about 10 to 20 feet. A loose, sandy silt to silty sand layer (approximately 20 feet thick) is immediately below the top layer of soil. At 40 feet bgs, the soil profile contains medium dense sand interbedded with silts, elastic silts, sands, and silty sand. All of the soils below 40 feet bgs, especially the silts, are loose in consistency.

WSDOT soil borings for the southeast portion of the alignment indicate that the surface layer consists of loose silt. At approximately 10 feet bgs, a layer of sand extends to 45 feet bgs. Below this layer is the Osceola Mudflow deposit that consists of loose sands and silty sands containing wood fragments and occasional deposits of gravel.
The soils that are below the Osceola Mudflow are primarily composed of medium dense to dense sands and sandy silts.

Permeability of the soil is moderately slow. The depth to groundwater in the project footprint varies from 2 to 15 feet depending upon location.

Elevated lead concentrations can be found in surficial soil adjacent to major roadways (e.g., Interstate 5) throughout the United States. The elevated lead concentrations are the result of automobile exhaust emissions when leaded gasoline was the principal automotive fuel.

Most of the acreage of the soil within the study area is protected from periodic flooding by dikes. However, as a result of the continually changing land use in the nearby upland areas, the soil may be subject to flooding by urban runoff.

3.3 Site Specific Environmental Concerns

Twenty-nine sites of concern are located in or adjacent to the footprint of the proposed project corridor. Please see Figure 3 for a site map identifying the specific sites of concern (identification numbers from the site map are included along with each site name).

3.3.1 Substantially Contaminated Properties

Commencement Bay, Nearshore/Tideflats Superfund Site (Site 1)

The northwest portion of the project footprint is within the boundary of the Commencement Bay, Nearshore/Tideflats Superfund Site. However, the SR 167 footprint does not intercept any of the four cleanup Project Areas included within the Superfund

Site. The Commencement Bay, Nearshore/Tideflats Superfund site covers 12 square miles in Tacoma. Within the boundaries of the Superfund site there are more than 300 active businesses and nearly 500 identified point and non-point sources of contamination. The site is divided into multiple Project Areas that are managed as distinct cleanup sites. The Project Areas include Asarco Tacoma Smelter, Ruston/North Tacoma Study Area, and Commencement Bay Nearshore/Tideflats. The following media are impacted within those four Project Areas: Air, groundwater, soil and sludges, sediments, and surface water.

The Asarco Tacoma Smelter operated for approximately 73 years. During that time, the facility smelted and refined copper from copper-bearing ores and concentrates. The molten and granulated slag from the smelting was poured into Commencement Bay. It is estimated that 15 million tons of slag exist at the smelter property and the slag peninsula. The contaminants that are prevalent on the Asarco property include arsenic, cadmium, copper, and lead. Remedial action on the site began in 1998 and most of the cleanup is to be completed by the end of June 2003.

The Ruston/North Tacoma Study Area encompasses approximately 950 acres and comprises a one-mile radius around the Asarco property. The soils within the Study Area are primarily contaminated with arsenic and lead that was released during the operation of the Asarco facility.

Within the Nearshore portion of Commencement Bay, a coal gasification plant operated from 1924 to 1956. In 1967, an auto recycler operated on the same property and contaminated the soil with acid, lead, heavy metals, polycyclic aromatic hydrocarbons and polychlorinated biphenyls. Tar-like contaminants and substances exist within the soil due to the previous uses of the site.

The Tideflats area of Commencement Bay is comprised of 10-12 square miles of shallow water, shoreline and adjacent land. The Tideflats Project Area includes the following waterways: St. Paul Waterway, Sitcum Waterway, Thea Foss and Wheeler Osgood Waterways, Hylebos Waterway, and Middle Waterway. The land within the Tideflats area is mostly all developed and heavily industrialized. Sediments within the marine area are contaminated largely due to the types of industries historically and currently existing within the Tideflats. These industries include: Shipbuilding, oil refining, chemical manufacturing and storage, and pulp and paper mills. The major contaminants within this Project Area include the following: Volatile organic compounds (VOCs), semi-VOCs and polycyclic aromatic hydrocarbons (PAHs), metals, polychlorinated biphenyls (PCBs), and organics.

Since 2000, The United States Environmental Protection Agency (EPA) has begun to oversee cleanup actions in the listed waterways within the Superfund site. Cleanup actions for the waterways are to be finished in 2004 if cleanup activities are completed on schedule. Both the EPA and Ecology are currently taking source control measures on all sources contributing to the listed waterways.

Olympic Pipe Line (Site 2)

The Olympic Pipe Line is located adjacent to the ROW of the northbound lanes of I-5 from the Puyallup River to the intersection of I-5 and SR 18. Portions of the pipeline are within the project footprint for proposed construction activities along I-5. The Olympic Pipe Line is designated as a substantially contaminated site due to the expense that would be incurred as a result of relocation of the pipeline, potential liability issues, and/or cleanup costs if the pipeline were ruptured during construction.

The types of fuel and the relative percentage of each type transported through the pipe line is 60% gasoline, 25% diesel fuel, and 15% jet fuel. The materials enter into the pipeline from four refineries located at Cherry Point and Anacortes. Pipeline customers pre-order the amount of materials they will need on a monthly basis. The customers are primarily based in Seattle (SeaTac airport), Tacoma, Olympia, Vancouver, and Portland. Approximately 145,000 barrels of total product run through the pipeline on a daily basis. A barrel equals 42 gallons. The pipeline itself is fourteen inches in diameter and was constructed with welded carbon steel. The depth of the pipeline is approximately 3 feet below ground surface (bgs) where it intercepts the SR 167 design footprint.

B&L Woodwaste Facility (Site 3)

The B&L Woodwaste Facility is an industrial landfill site that operated from the mid-1970's until the early 1980's. The property is adjacent to proposed project footprint at the I-5/SR 167 intersection. According to a Department of Ecology fact sheet issued in 1992:

> "Wood chips, sand, rock, and Asarco slag were dumped at the site. Most of these materials came from log sorting yards in the Tacoma Tideflats. The slag and site soils contain elevated levels of arsenic and other heavy metals that are released from the site to the environment. A system of ditches along the site boundary collects leachate and runoff from the fill and discharges it to Surprise Lake Ditch, which drains to Hylebos Creek.
>
> In 1982, the Commencement Bay Nearshore/Tideflats was added to the National Priorities List (NPL) under the Comprehensive and Environmental Response Compensation and Liabilities Act of 1980 (CERCLA). The NPL site includes Hylebos Waterway and sites, including B&L Woodwaste, which are believed to contribute contamination to the Waterway. The Record of Decision for the Commencement Bay NPL site lists B&L Woodwaste site as a source of arsenic, copper, and lead to the head of Hylebos Waterway problem sediment area."

In December of 1991, the B&L Woodwaste Facility was issued enforcement order 92TC-S214 by the Department of Ecology. The cleanup order, completed in 1993, included the following tasks:

- Consolidation of the landfill;
- Excavation and cleanup of contaminated ditch sediment;
- Isolation of the fill from off-site surface water and groundwater;
- Installation of a site cap; and
- Compliance monitoring of groundwater and surface water (including drinking water wells).

Section 1 of the enforcement order 92TC-S214 indicates that:

> "Any activity on the Site that may interfere with or reduce the effectiveness of the Cleanup Action or any operation, maintenance, monitoring, or other activity Required by the Order is prohibited. Any activity on the Site that may result in the release of a hazardous substance that was contained as part of the Cleanup Action is prohibited. Some examples of prohibited activities include, for the fenced portion of the Site: drilling; digging; movement or placement of any objects which deform or stress the ground surface; piercing the surface with a rod, spike, etc.; damaging or plugging a well or gas vent; bulldozing; earthwork; deposition of waste or other materials. The Ecology project coordinator must be informed in writing two weeks prior to any Site activity not performed pursuant to Order No. DE 92TC-S214."

In April 2000, elevated levels of arsenic were detected in wetlands and a municipal well next to the boundaries of B&L Woodwaste. The highest level detected, 6.0 mg/L, was 120 times higher than the federally acceptable standard of drinking water. State officials reviewed the 1993 cleanup of the mound site. As of April 2001, Department of Ecology is requesting that one of the potentially responsible parties, Asarco, determines the extent of arsenic contamination within the soils and groundwater adjacent to the site.

United States Gypsum (USG) Company Highway 99 Site (Site 4)

The USG site is located within the proposed project footprint near the I-5/SR 167 intersection. United States Gypsum Company previously operated a mineral wool insulation plant in Tacoma. The company used copper slag from a nearby smelter as one of the raw materials for the manufacture of its mineral wool. The waste material from the slag contained both non-toxic and toxic materials, including arsenic. The USG Company Highway 99 Site was one of two disposal locations for the waste materials. A Department of Ecology memorandum issued in June 1986 indicated that:

> "USG Corp Highway 99 Site is a three acre site located between US Highway 99 and I-5 west of Milton. This landfill site had received (between 1971 and 1973) baghouse dust comprised chiefly of insulation produced by USG from Asarco slag. From 20,000 to 30,000 cubic yards [15,291 to 22,936.8 m^3] of baghouse dust total had been disposed of at this site and a second site in Puyallup. The baghouse dust, comprised approximately 10% of total waste, was found to contain 21.7% arsenic.

File review indicated that the waste removal operation at the Highway 99 site went as planned. Soil clean-up levels specified in the Remedial Action Plan (0.5ppm) were achieved.

USG voluntarily conducted excavation and removal of arsenic bearing waste from October 12, 1984 to January 25, 1985 as agreed in a Consent Order (86-S130) signed by USG and Ecology SWRO. The Order, issued August 17, 1984, required submittal of a Remedial Action Plan, Engineering Plan, Health and Safety Plan, and a post-cleanup site monitoring plan as well as stipulation that remedial action be taken by USG.

File review indicates that the waste removal operation at the Highway 99 site went as planned. Soil clean-up levels specified in the Remedial Action Plan (0.5ppm arsenic) were achieved. The post-cleanup site monitoring plan, which is incorporated as part of the Order, stipulates that ground water will be monitored at two (2) selected wells at the Highway 99 site for 12 months or until a 0.5 ppm arsenic concentration (or less) is achieved."

USG's one hundred fifty-eighth monthly progress report, completed in March 2000, indicated that groundwater arsenic levels on the site range from <0.001 to 8.97 ppm. The current, and newly adopted, cleanup level for arsenic under the Model Toxics Control Act Method A Cleanup Standards is .05 ppm.

3.3.2 Reasonably Predictable Properties

Rick Sexton Drums (Site 5)

Rick Sexton Drums is located within the proposed project footprint near the I-5/SR 167 intersection. Drums and miscellaneous containers with unidentified contents were visible on site during a windshield survey of the property. Some of the containers were stored on wood pallets, but no secondary containment devices were visible on the property. Small storage containers are on the site, and at least one is marked with a sticker indicating that flammable materials are stored within the container. Observations during the windshield survey also indicated that welding activities occur on site as various sizes and types of metals were observed on the property. A chimney located on the south side of the structure may be an indication that a heating oil UST and/or asbestos containing material (ACM) exists or previously existed on the property.

Commercial Sales Inc. (Site 6)

Commercial Sales Inc. is located outside of the project footprint near the proposed intersection of I-5 and SR 167. Commercial Sales Inc. is a company that sells various machine and equipment parts. Multiple types of used items were observed on site,

including: Large and small gas/diesel motors, gears for equipment, cargo containers with unknown contents, mowers, scrap metal and welding equipment, and heavy machinery and pulleys for work in a marine environment. Due to the type of equipment observed on the property, it is likely that the following materials are also present on site: Acids, metals, solvents, and petroleum products.

Coast Engine and Equipment Co. (Site 7)

Coast Engine and Equipment Company is adjacent to the portion of the proposed project footprint that connects with SR 509 near Alexander Avenue. Coast Engine and Equipment is listed as a large quantity generator of numerous wastes, including methylene chloride, trichloroethylene xylene, xylene, paint, and metal phosphoric acids. Three prior generator violations exist for the company, but all were brought into compliance in 1995. The last biennial reporting year that Coast Engine and Equipment Co. submitted a "Notification of Dangerous Waste Activities" form was 1997. A windshield survey of the site indicated that a large train car maintenance facility exists on site. Engine parts and miscellaneous pieces of equipment were scattered over the entire property. Fifty-five gallon drums were visible on the north side of the train repair facility. However, the contents (if any) of the drums were unknown due to the lack of visible identification labels on the drums. There were no secondary containment devices located beneath or around any of the drums. There are four structures and multiple trailers on the site. Due to its apparent age, the train repair facility may contain lead based paint and asbestos containing materials. Observation of the Coast Engine and Equipment property was restricted due to the size of the property and inability to obtain an unrestricted view of the site.

Firwood Gym (Site 8)

Firwood Gym is located within the current proposed project footprint. The exact date Firwood Gym was constructed is not known but the date 1947 is engraved on the front of the building. A locked chain link fence surrounds the building on site. The area immediately behind the building, surrounded by a smaller chain link fence with privacy strips, appears to contain the following miscellaneous items: Large tires, truck parts (engines), scrap metal, various chemical storage tanks, and other miscellaneous items. Both the chimney, visible on top of the building, and the age of construction are indications a boiler room may be present within the building. Asbestos containing materials and lead based paint may also exist within the structure. There is potential for the presence of an underground heating oil tank on the site. The windows are sealed prohibiting the identification of the items, if any, that are within the improvement. The site is not listed on any of the regulatory environmental databases reviewed for the project.

Valley Avenue Residences (Site 9)

The Valley Avenue Residences are improvements that exist on WSDOT assigned parcel plots P249 – P253 and P224 and are within the proposed project footprint. The parcel plot numbers represent residential properties that are located on Valley Avenue west of Freeman Road. The property plots are not owned by WSDOT and the numbers were assigned for identification purposes. Two large greenhouses are located on these plots. During a windshield survey, numerous chemical containers with unidentified contents were visible throughout the properties. Chemicals that may be present on-site include pesticides, herbicides, and insecticides. The parcels are not listed on any of the regulatory environmental databases reviewed for the project.

Jesse Engineering (Site 10)

Jesse Engineering is within the portion of the project footprint that crosses 54th Ave E. During a windshield survey, surficial soil staining was visible at the property. Services available from Jesse Engineering include steel and metal fabrication as well as machine manufacturing. Various chemical drums without containment were also visible on site. Materials likely to be used for operations include lubricants/oils, several acids, and metals. There are multiple improvements on the site, and the older structures could contain asbestos containing materials and/or lead based paint. The property is not listed on any of the regulatory environmental databases reviewed for the project.

Firwood Grocery (Site 11)

Firwood Grocery is adjacent to the portion of the mainline project footprint that crosses Valley Avenue East. In 1996, vent pipes and a pavement patch noted on the property indicated the potential presence of one or more underground storage tanks. Pierce County requested that Landau and Associates investigate the Firwood Grocery property to determine if underground storage tanks existed on site. The County also asked Landau Associates to determine whether Firwood Grocery was previously used as a gasoline station. Landau Associates researched records from the Department of Ecology and the Tacoma-Pierce County Health Department and found no evidence of USTs or a gas station existing on the site.

At the request of Pierce County in September 1996, Landau and Associates performed a Phase II investigation of Firwood Grocery to determine the presence of petroleum hydrocarbons within the County right-of-way on the south side of Valley Avenue (immediately west of Freeman Road). Soil and groundwater sample results from two boring locations detected gasoline, diesel and motor oil range hydrocarbons. Field observations indicated contamination also existed on other parts of the property.

A review of the title history for the property disclosed that Shell station had leased the site in 1928. In December 1996, a geophysical survey was conducted to locate possible underground storage tanks and piping within the County's right of way. Three targets

were found during the survey, but only two produced images that were likely representative of underground storage tanks. Landau and Associates' report indicated that the suspected underground storage tanks are about 4 feet bgs and have an estimated capacity of 1,500 gallons each. Department of Ecology records do not include any information about activities at the site since the completion of the Phase II site investigation in 1996.

SR 167/20E (Meridian St.) Steel Bridge (Site 12)

All of the SR 167/Meridian St. interchange options include the removal of the existing steel bridge (SR 167/20E) over the Puyallup River. Construction of the bridge was completed in 1925 and lead based paint remains on the structure. The bridge is 372 feet in length and 21 feet in width.

The procedure that will be used to demolish the bridge has not yet been determined. However, there are two types of demolition options that have been used on similar WSDOT bridge removal operations in the past, and it is likely that one of the two options will be used for this project. One option is to first remove all lead based paint from the bridge then drop the structure into the river for removal. The second option entails building pilings beneath the bridge deck, then removing the entire bridge structure piece by piece. The second option would not require removal of the lead based paint from the bridge prior to demolition. The bridge is not listed on any of the environmental databases reviewed for the project.

All State Industrial and Marine (Site 13)

All State Industrial and Marine is located outside of the current proposed project footprint. Department of Ecology records indicate that until 1997 All State Industrial and Marine was a permitted commercial waste transporter. There are no reports of violations listed for the company within Ecology records. Ecology records do not indicate that the company currently participates in dangerous waste activities. During a windshield survey, the following items were observed on site: Concrete and polyvinyl chloride (PVC) piping, unlabeled 55 gallon drums that appeared to be empty, various containers with unidentified contents, and at least one drum with an attached pump (potentially for fueling purposes). The view of the site was restricted due to landscaping and a fence surrounding the property.

Specialized Transport Service (Site 14)

Specialized Transport Service is located outside of the current project footprint. Department of Ecology records indicate Specialized Transport Service was a transporter of hazardous materials until 1992. During a windshield survey, numerous truck cabs and trailers, as well as surficial staining on small portions of the ground surface, were observed on site. A large building on site appears to be used as a maintenance facility for the semi-trucks and trailers. Due to observed activities, it is likely that petroleum

products and solvents are used during the maintenance activities. There were no containers or drums of materials visible outside of the building. However, a complete view of the site was not possible due to limited public access and a chain link fence surrounding the perimeter of the property.

Vitamilk Dairy-Fife (Site 15)

Vitamilk Dairy-Fife is located within the current project footprint at the SR 167/I-5 Interchange. According to Ecology records, two underground storage tanks were installed on the property in 1964. Leaded gasoline and heating oil were contained in the steel tanks. The tanks were removed from the site and records do not indicate that any contamination was discovered during the removal of the tanks. During a windshield survey of the property, the site appeared to be well maintained and organized. Due to the apparent age of the improvement on site, there is a potential for the presence of asbestos and/or lead based paint.

Richard Johnson Property (Site 16)

The Richard Johnson property is located within the current project footprint at the SR 167/I-5 Interchange. This site is now a vacant, unimproved lot. Ecology records indicate that two tanks were installed on the property in 1964. Both tanks contained leaded gasoline and were reportedly closed in place. There are no records to indicate that contamination was encountered during the closure of the tanks. However, in 1989, Mr. Johnson notified Ecology by letter that the tanks and pumps had been removed from the site. Ecology's Underground Storage Tank database lists the status of both tanks as "closed in place."

Milgard Tempering (Site 17)

A small portion of the Milgard Tempering property may be included within the project footprint depending upon choice of interchange options at 54th Avenue. Milgard Tempering is a glass fabrication business that occupies multiple improvements on 54th Avenue in Fife. In 1997, Milgard Tempering submitted a Notification of Hazardous Waste Activities as a small-quantity generator. The company generated petroleum naptha waste from Safety Kleen cleaning stations as well as waste paint and other related material. The company has two previous violations listed with Ecology, but both violations were brought into compliance in October of 1995. The final year Ecology received waste generation notification from Milgard Tempering was 1997. Observations during a windshield survey indicated that the property was well maintained with no visual indications of poor housekeeping measures or potential spill sources on site.

S&J Trucking (Site 18)

S&J Trucking is within the current project footprint at the intersection of SR 167 and Valley Avenue. In 1993, S&J Trucking submitted a Notification of Dangerous Waste

Activities to Ecology as a commercial transporter of waste. There are no violations listed for the company. There were no indications that trucks are currently stored or maintained at the property. The property appears to be developed as a residence. Ability to visually observe the entire property was limited due to landscaping around the perimeter of the property.

Don Olson Construction (Site 19)

The site referred to as Don Olson Construction is within the current project footprint near the intersection of Freeman Road and SR 167. Four USTs, containing both leaded and unleaded gasoline as well as diesel, were installed on the property in 1983. In 1996, all four of the USTs were removed from the site and petroleum contaminated soil was encountered below a vent line and dispenser. A total of 305 yards of contaminated soil were disposed of off site. Groundwater was not encountered during excavation activities. Analytical results from remaining soils within the excavation indicated petroleum levels were well below MTCA cleanup levels. A windshield survey of the property indicated that there are a few small improvements on the site. Activities occurring on the property could not be observed due to restricted view. There were numerous vehicles on site, but it was unclear whether the vehicles were functional or abandoned. Miscellaneous containers with unidentified contents were also visible on the property. Ecology records indicate the lease with Don Olson Construction expired in 1996; the current owner of the property is unknown.

Portac,Inc. (Site 20)

Portac, Inc., a fully operational lumber yard, is located adjacent to the project footprint near the intersection of SR 167 and SR 509. Two USTs, containing diesel and leaded gasoline, were installed on the site in 1964. The tanks were removed from service in 1987, and Ecology records do not indicate contamination was discovered during the excavation. Portac, Inc. is also a small quantity hazardous waste generator but does not have any violations listed with Ecology. Heavy equipment and lumber manufacturing machines are present on the property. There were no signs of contamination observed during a windshield survey of the property.

North American Crane and Equipment Co. (Site 21)

North American Crane and Equipment Co. is outside of the project footprint. The property is located in the southeast corner of the I-5/Porter Way Intersection. The site is a large quantity generator of hazardous wastes that most likely includes petroleum products and solvents. There are no violations listed by Ecology for this company. During a windshield survey of the site, multiple improvements were observed on the property. Activities occurring on the site are unknown but are likely to include maintenance and machine work. There were no visual indications of contamination observed during the windshield survey.

Arco 5898 (Site 22)

The Arco station is immediately adjacent to the footprint of the mainline in the northeast corner of the SR 167/Meridian Street Intersection. In 1993, four USTs were installed on the site to store leaded and unleaded gasoline. Ecology records indicate the tanks each have a 5,000-10,000 gallon capacity and are composed of fiberglass-reinforced plastic. The site does not have any violations listed under any of the environmental databases reviewed for this study.

BP (Tosco) #11073 (Site 23)

The BP station is located north of the project footprint at the I-5/54th Street Interchange. According to Ecology records, a new oil/water separator was installed for a new car wash operation in January of 1996. At this time, soil and groundwater contamination was encountered on the site. Soil samples exceeded MTCA cleanup limits for gasoline, diesel, and BTEX. Groundwater samples exceeded MTCA cleanup limits for TPH, benzene, ethylbenzene, and xylene. Ecology monitoring records indicate that as of March 1999, groundwater contamination exceeded MTCA cleanup limits for gasoline and BTEX. However, the monitoring records were sporadic and contaminants were not encountered in each of the five monitoring wells on the site. The inferred groundwater flow direction on the site is to the northeast. Although multiple interim cleanup reports have been submitted to Ecology, records do not indicate cleanup has been completed.

CAC Inc. 97135 (Site 24)

The Chevron station is located outside of the project footprint in the northwest corner of the I-5/54th Street Interchange. In 1993, this Chevron station had a release of petroleum products from an UST to soil and groundwater on site. Both contaminated media exceeded MTCA cleanup limits for diesel, benzene, and toluene. In 1994, contaminated soil was excavated near the west and south central pump islands. Some of the contaminated soil was not removed from the site because the excavation would have jeopardized the stability of the station canopy. Groundwater monitoring records indicate separate phase hydrocarbons were no longer present in 2000.

Tosco #03139-30137 (Site 25)

The Tosco (BP) station is located outside the project footprint in the southwest corner of the I-5/54th Street Interchange. Contaminated groundwater and soil were encountered during an UST replacement project in July 1995. Samples were taken from the excavation of the removed UST as well as the excavation for the new UST. Soil and groundwater samples exceeded MTCA cleanup limits for TPH-Gasoline, BTEX, heavy oils, and diesel. Approximately 3,000 tons of soil were removed from the site and disposed of at TPS Technologies in Tacoma. Ecology records indicate gasoline, diesel

and BTEX contamination remained on site as late as 1997. Ecology received an interim cleanup report for the site, but records do not indicate final cleanup has occurred.

Unocal 4836 (Site 26)

The Unocal 4836 property is located outside of the project footprint in the southeast corner of the I-5/54th Street Interchange. In January 1992, all of the underground and above-ground facilities were demolished and removed from the property. Contaminated soil and groundwater were encountered during the UST decommissioning activities. Both soil and groundwater were contaminated with gasoline, heavy oils, and solvents above MTCA cleanup levels. Contaminated soils were removed from the site in 1995. Ecology records indicate that petroleum contaminated soil and groundwater exist to the west and northeast of the site. The January 2000 quarterly groundwater monitoring report to Ecology indicated that groundwater is still contaminated above MTCA cleanup levels for BTEX, TPH-Gasoline, and diesel-range hydrocarbons. The inferred groundwater flow direction is to the north, and the site is used as a small park area for the city of Fife.

Auto Warehousing Company (Site 27)

The Auto Warehousing Company is located immediately adjacent to SR 509 ROW near the SR 509/Alexander Avenue Interchange. The site is not currently within the mainline footprint. Auto Warehousing Company is a storage lot for new cars brought into the Port of Tacoma. According to Ecology records, five USTs were installed on the site in 1964 and contained kerosene and gasoline. Three tanks have been removed from the property leaving only two tanks operational on the site. The USTs on site contain kerosene and unleaded gasoline. EDR records indicate that the property is a LUST (Leaking Underground Storage Tank) site. Both groundwater and soil are affected on the site. The Ecology LUST database indicates that cleanup has begun on the site and that both soil and groundwater are currently being monitored.

H&H Diesel (Site 28)

H&H Diesel is adjacent to the current project footprint and is located in the southeast corner of the I-5/Porter Way over crossing. H&H Diesel is a diesel engine repair facility with tractor-trailer parking and storage also on site. The property is listed on Ecology's LUST site and contains soil and groundwater contamination. Ecology records indicate a Phase II investigation was conducted in October of 1999. The study reports that diesel and heavy oil-range petroleum hydrocarbons and volatile organic compounds exceed MTCA Method A cleanup levels for soil and total xylene concentrations for groundwater. Records also indicate that soil and groundwater contamination were both localized in an area approximately 60 by 90 feet to a depth of 4 feet (water table). The localized area of contamination is approximately 20 feet east of the repair shop on site.

The property owners have indicated they would like to enter the Voluntary Cleanup Program with Ecology. The program allows for independent site cleanup with the

assistance of Ecology. However, Ecology files indicate that the terms of the site cleanup under the VCP have not been agreed upon between Ecology and the property owner. Ecology's site file also does not contain information documenting any cleanup activities on the site.

Texaco #63 232 0500 (Site 29)

The Texaco property is located outside of the project footprint in the northeast corner of the I-5/54th Street Interchange. A Shell gasoline station previously operated at this location. At the time Texaco gained ownership (date unknown), new tanks and piping were installed on the property. At this time, contamination was encountered due to a leaking UST which was subsequently removed from the site. In 1994, 3,000 tons of petroleum contaminated soil and 40,000 gallons of water were disposed of off site. Some petroleum contaminated soil was not excavated from the site due to poor access. The highest concentration of soil contamination remaining on the site was 350 mg/kg for petroleum contamination. The 40,000 gallons of water that was removed from the site were treated with activated carbon to reach non-detect concentrations and were then disposed of into the stormwater system. The latest recorded quarterly groundwater sampling (October 2000) indicated groundwater remains contaminated above MTCA cleanup levels with BTEX, TPH-Gasoline, and MTBE. The October 2000 monitoring report indicates the highest concentrations are located on the south side of the property.

4.0 POTENTIAL IMPACTS

This report provides a conservative analysis of potential impacts by reviewing all potential properties that may be acquired for the SR 167 project. Due to the preliminary stage of many footprint design options, adjustments to the footprint are anticipated. These adjustments to the project design will have a bearing on which properties are actually acquired for the project as well as the specific potential impacts that may be incurred by the agency.

This section of the report presents an evaluation of potential impacts that known or suspected contamination may have on project development. Potential construction impacts for substantially contaminated sites are discussed in detail, and potential impacts for sites with reasonably predictable environmental concerns are discussed in general terms. Issues associated with hazardous substances common throughout the project area (e.g., asbestos containing materials, lead based paint, hazardous materials spills) follow the site-specific presentations. Impacts are considered sequentially as follows:

- **Project Involvement Summary -** potential property acquisition requirements;
- **Potential Projects Impacts** - cleanup liability, worker safety, construction activities, interchange options, USTs, asbestos/lead contamination, hazardous materials spills, secondary impacts, cumulative impacts, and operational impacts;
- **Potential Regulatory Considerations** - regulatory requirements and the potential impacts most likely to affect the entire project footprint and/or specific sites; and
- **Recommendations for Further Investigation** - identifying data gaps to refine the scope of environmental contamination and liabilities associated with acquisition properties.

4.1 Project Involvement Summary

This section presents a summary of the selected project alternative relative to the discipline study area and describes potential property acquisition requirements.

Throughout the project footprint, multiple large and small parcels will be acquired. Some of the sites that present specific concerns may not be acquired but have the ability to impact properties to be acquired by WSDOT. There are multiple buildings that may be demolished during the construction of the preferred alternative and/or widening of

existing Interstate 5 right-of-way. It is possible that some of the structures to be acquired by WSDOT may contain ACM and LBP. Property acquisition will generally be limited to those parcels that fall within the project footprint, including new interchanges and potential lane widenings along Interstate 5.

4.2 Potential Project Impacts

This section summarizes potential construction impacts that may affect the ROW acquisitions based on known or suspected contaminated properties identified in Section 3.0.

The twenty-nine properties analyzed each present a potential for contamination. Four of the sites are considered substantially contaminated and the remaining twenty-five are reasonably predictable. Further investigation, including sampling before construction, could be necessary for more closely estimating costs for any cleanup, worker safety and/or construction impacts. The potential impacts to the project are divided into the following categories: Cleanup Liability, Worker Safety, Construction Impacts, Interchange Options, Underground Storage Tanks, Lead Contaminated Soils, ACM/LBP, Hazardous Materials Spills, Secondary Impacts, Cumulative Impacts, and Operational Impacts. All of the costs associated with the identified impacts are discussed in the Cost Estimates section of the Mitigation portion of the study.

4.2.1 Cleanup Liability

Cleanup liability refers to the immediate or long-term costs associated with the acquisition and/or construction of contaminated properties.

The northwest portion of the project footprint is within the Commencement Bay Superfund site. However, WSDOT does not anticipate any liability impacts related to the listed Commencement Bay Project Areas because the project is within site source control areas only. If a spill were to occur prior to completion of the cleanup activities within a listed waterway, the EPA and Ecology would assess the level of liability in reference to the current status of the waterway. The assessment would be based on the effect of the spill on currently ongoing cleanup activities. If a spill occurs after cleanup activities are completed on a listed waterway, EPA and Ecology would treat the spill as a new release and WSDOT would be required to follow appropriate state and federal regulations.

Hazardous materials spills that impact a Superfund water body (Hylebos Creek), surface water body (Wapato Creek), groundwater, or soils located within the project footprint may result in WSDOT and/or the contractor incurring liability for an appropriate cleanup of the affected area and paying multiple fines for environmental damages to state and federal agencies. If any hazardous waste were generated as a result of the spill, the agency and/or the contractor would retain liability for management of those problem wastes even after disposal is complete.

WSDOT also does not anticipate any liability impacts with the Olympic Pipe Line that is within the project footprint at the proposed SR 167/I-5 Interchange. However, if WSDOT were to rupture the pipeline during construction activities, the cleanup costs could be extensive. Any product that escaped during a rupture in the pipeline could drain into Hylebos Creek. Hylebos Creek drains to Hylebos Waterway, which is a listed water body within the Commencement Bay/Nearshore Tideflats Superfund site. A rupture in the pipeline could result in WSDOT paying for an appropriate cleanup of the impacted area, damage costs to Olympic Pipe Line, and multiple fines for environmental damage.

WSDOT would acquire liability for property that is acquired that contains soil and/or groundwater contamination. Liability issues for sites with contamination can also extend beyond the property boundaries if contamination migrated off site through soils or groundwater. Both the B&L Woodwaste and USG Highway 99 properties contain known arsenic contaminated media. If WSDOT were to acquire either B&L Woodwaste or the USG Highway 99 site, the agency would incur liability for the contaminated media on site. In addition, WSDOT may also assume liability for ongoing groundwater monitoring activities at the USG Highway 99 Site.

Sites are listed in Table 2 that have known soil and/or groundwater contamination but are not within the current project footprint. The known contamination on these sites could migrate into the project footprint affecting construction activities. Migration of contaminants is more likely to occur with groundwater than with soil due to the ability of water to carry the contaminants quicker and farther. B&L Woodwaste, Firwood Grocery, Auto Warehousing Co., and H&H Diesel, all properties with known soil and/or groundwater contamination, are adjacent to the project footprint. The intersection of 54th Avenue East and 20th Street contains four gasoline stations that each pose soil and groundwater contamination issues. While the soil and groundwater appears to be remediated on some of the sites, there is a potential for contamination from one or more of those properties to have migrated beyond the perimeters of the site. Groundwater flow in this particular intersection is documented as north to northwest, so it is possible that any contamination that migrated off site entered WSDOT ROW along Interstate 5. WSDOT would not incur liability for groundwater contamination that has migrated into the project footprint as long as the agency does not acquire the source of the contamination. Any contaminated groundwater that has entered into the project footprint may create an impact to construction activities as described in further sections of this discipline study.

If WSDOT acquires a property where unknown contamination exists, the agency would incur liability for any contamination as well as the removal of any stored materials remaining on site at the time of acquisition. WSDOT could also incur the costs for characterization and disposal of any contaminated media or materials that are on site. Construction activities could impact unknown contamination at any of the sites within the project footprint that are listed in Table 2 (Section 2.5). However, it is unlikely that all of the sites listed in Table 2 contain unknown contamination, and the information is detailed in this discipline study so that specific site information is considered prior to

commencement of construction. Some of the sites within the project footprint that may contain unknown contamination include: Auto Warehousing Company, Portac, Inc., Richard Johnson property, Jesse Engineering, Rick Sexton Drums, and the Valley Avenue Residences.

If an underground storage tank were encountered during excavation activities, WSDOT would assume cleanup liability for the appropriate decommissioning and removal of suspected USTs on site. WSDOT may also acquire cleanup liability for any contaminated media resulting from a leaking UST in the right of way. Magnetometer readings and the presence of a chimney suggest a potential for an abandoned UST at the Firwood Grocery property. There are also potential USTs remaining on the Richard Johnson and Rick Sexton Drums properties.

All of the SR 167/Meridian Street Interchange options include the removal of the SR 167/20E steel bridge. If lead based paint from the structure and/or other contaminants enter the Puyallup River during demolition activities, WSDOT would incur costs for an appropriate cleanup of the area including multiple fines for environmental damage.

4.2.2 Worker Safety and Public Health

This section presents potential worker safety and public health considerations related to environmental issues that may arise during construction. It does not address non-environmental health and safety issues such as working near traffic or moving machinery, working off the ground or over water, and excavation cave-ins.

A common worker health and safety issue that arises on construction projects is encountering contaminated environmental media (i.e., soil, groundwater, surface water, and vapors). Worker exposures can occur during excavation and management of contaminated environmental media. Toxic vapors can accumulate in excavations and pose an exposure threat to personnel in the immediate area. In most cases, this can be anticipated based on known or probable areas of contamination. Workers should also anticipate that they might encounter unknown contamination during construction activities.

Any abandoned drums or containers on site may become punctured due to construction activities. Drums or containers may contain vapors that produce physical symptoms such as dizziness, irritated or burned skin and eyes, long-term serious injury, suffocation, and death.

If construction activities were to result in a rupture to the Olympic Pipe Line, there is a potential for fire and/or explosion that could result in severe injuries or fatalities. Dermal contact with the products transported in the pipeline may also irritate or burn skin and eyes. Fire may produce irritating, corrosive and/or toxic gases. Any vapors that are released from the pipeline may cause dizziness or suffocation. Explosion and fire

hazards, as well as toxic vapors, can also be released from underground storage tanks that are encountered during construction activities.

Inhalation and ingestion of lead based paint and asbestos containing materials could have a damaging effect on workers' health. Inhalation and ingestion of LBP and ACM during bridge removal, building activities, and excavation of lead contaminated soils can pose serious risks to workers' health and safety. Common short-term symptoms of lead poisoning include abdominal pain, headaches, constipation, and aches in the joints. Exposure to high levels of lead poisoning can result in retardation, convulsions, coma, and death. The risks associated with low levels of contact with asbestos are not well established, so the EPA concludes there is no level of exposure below which the risks of contracting an asbestos-related disease are zero. Exposures to asbestos can result in long-term progressive illnesses including lung cancer, asbestosis, and mesothelioma.

Another possible concern for the SR 167/20E steel bridge is bird guano that poses an inhalation risk to workers. Histoplasmosis is an infectious disease caused by inhaling spores of a fungus called Histoplasma capsulatum that is found in bird droppings. According to the National Institute for Occupational Safety and Health, before an activity is started that may disturb any material that might be contaminated by *H. capsulatum*, workers should be informed in writing of the personal risk factors that increase an individual's chances of developing histoplasmosis. Such a written communication should include a warning that individuals with weakened immune systems are at greatest risk of developing severe and disseminated histoplasmosis if they become infected. These people should seek advice from their health care provider about whether they should avoid exposure to materials that might be contaminated with *H. capsulatum*.

Workers may ingest and/or inhale contaminants that are associated with equipment and materials that are brought on site during construction activities. Contact with contaminants may occur if appropriate personal protective equipment is not donned prior to commencement of work. The Washington State Department of Labor and Industries requires that personnel receive proper training for working with hazardous materials and donning appropriate personal protective equipment. Contact with petroleum products and solvents commonly used on construction projects can result in irritated or burned skin and eyes.

Depending on the nature of any contamination encountered during construction activities, worker safety training (such as 40-hour Hazwoper training) may be required of personnel working on the site. See Section 4.6 for information on the regulatory requirements for personnel training under WAC 296-62.

4.2.3 Construction Impacts

A delay in construction may occur if unknown contamination and/or drums and containers are encountered during construction activities. Sites where unknown contamination may be encountered within the mainline include the reasonably predictable

sites listed within Table 2 (Section 2.5). The sites listed in Table 2 that are adjacent or outside of the project footprint could have contamination that migrated from the site into WSDOT ROW.

Unknown contamination may also be encountered in heavily industrialized areas. Areas with the highest potential for unknown contamination typically occur within properties with a long and varied history of industrial and commercial uses. The portion of the project footprint that extends from I-5 to SR 509 is the area with the highest potential for containing unknown pockets of contamination.

If a property with unknown/known contamination is acquired, construction could be delayed until the contaminated media is characterized and disposed of properly. These types of construction delays can occur because soils and groundwater are typically stockpiled and stored on site until analytical results are returned from the laboratory. At that time, an appropriate disposal facility is chosen (if necessary) and the contaminated media are disposed of off site.

Construction (staging) activities may be affected depending upon the need to alter their proximity to contaminated media, underground storage tanks, Olympic Pipe Line, etc. Alternative construction techniques may need to be employed to minimize potential earthwork occurring near any of the above-mentioned potential liability issues.
If contamination were encountered during construction activities, special handling/disposal and characterization of dewatering effluent and soils would be required for any contaminated media on site. WSDOT would be responsible for proper management of any regulated hazardous wastes.

An Enforcement Order that could affect construction is in effect for the B&L Woodwaste site. Enforcement Order 92TC-S214 requires that the Ecology project coordinator be notified two weeks prior to any activity being performed that is not pursuant to cleanup orders. On the USG Highway 99 Site, locations of existing on site monitoring wells should be identified prior to any excavation work commencing on the property. Depending upon construction activities, the monitoring wells may need to be removed or relocated. Relocating the wells and/or excavation work could impact ongoing monitoring activities, cleanup activities, and/or natural attenuation goals expressed in the cleanup plan.

If not properly managed, lead based paint on the SR 167/20E steel bridge could cause construction delays during demolition activities. Similarly, the need to abate ACM and LBP in buildings, if not done in advance, could delay work.

4.2.4 Interchange Options

This section of the discipline study provides the results of a comparative analysis of the impacts associated with each individual interchange option. Specific information regarding the history and impacts of the sites discussed below is included within Sections

3.0 and 4.0 of the discipline study. Please see Figure 2 for maps of each interchange option. For each interchange option, it is possible that improvements that are demolished for the project may contain ACM/LBP. The sites that were included in Table 1 and Table 2 will be included within the following analysis of the interchange options. However, it is possible that improvements not identified within the following discussion may require a proper ACM/LBP survey and possible abatement prior to construction activities.

- **54th Avenue Interchange Options:**

  The Loop Ramp Interchange Option requires the acquisition of multiple commercial/industrial properties not otherwise included in the mainline. Although the properties that would be acquired for this option are not known contaminated properties, there remains a potential for encountering unknown contamination due to the historical and current uses of the sites in this immediate area.

  The Half Diamond Interchange does not impact any known contaminated sites and requires the acquisition of only a few residential improvements that would not otherwise be included in the mainline footprint. The acquisition of a small number of improvements creates a relatively low risk for encountering unknown contamination during the construction of this interchange option; therefore, the Half Diamond Interchange is the preferable option.

- **Interstate 5/SR 167 Interchange Option:**

  Due to the complexity of this interchange and limited solutions for the freeway-to-freeway connections, only one design option could be developed to reasonably meet the needs of this location. Specific information regarding the history and impacts of the sites within this interchange option is included in Sections 3.0 and 4.0 of the discipline study. The specific sites of interest for this interchange include the following: USG Highway 99 site, Surprise Lake Ditch (groundwater from B&L Woodwaste), H&H Diesel, Rick Sexton Drums, Vitamilk Dairy – Fife, and Richard Johnson property.

  The construction of the Interstate 5 on-ramp and off-ramp at 54th Avenue could be delayed due to possible groundwater contamination. There are five gasoline stations adjacent to the intersection that have known petroleum contaminated groundwater and soil. It has been documented that some of the contamination has migrated off site. Due to the groundwater flow in this area, it is possible that groundwater contamination migrated into the WSDOT ROW. Possible groundwater contamination could cause a delay in construction only if excavations reached the water table and dewatering became necessary.

  If a large spill were to occur during construction of this interchange, contaminants would likely enter Hylebos Creek. Hylebos Creek flows into the Hylebos Waterway, which is a listed site within the Commencement Bay/Nearshore

Tideflats Superfund Site. If contamination from a spill reaches the Hylebos Waterway, WSDOT would incur liability for the cleanup and Ecology and EPA would determine the effect and liability for ongoing cleanup activities within the listed waterway.

- **Valley Avenue East Interchange Options:**

  The Freeman Road Interchange Option impacts the contaminated property of Firwood Grocery located in the southwest corner of the Freeman Road/Valley Avenue Interchange. The site contains petroleum contaminated groundwater and soil, and WSDOT would incur liability for cleanup of the site as well as characterization and disposal of the contaminated media encountered during construction. Also, several semi-trucks are parked on property located in the northwest corner of the same interchange. While not a listed site, due to the storage of the semi-trucks and possible maintenance activities on site, there is a possibility of encountering unknown contamination on this property. The Freeman Road Interchange requires the acquisition of improvements located along Freeman Road that may result in liability issues for WSDOT if either ACM and/or LBP exist in the structure or if any unknown contaminants are on site.

  The Valley Avenue and Valley Avenue Realignment Interchange Options are preferable choices for the Valley Avenue/SR 167 Interchange based upon hazardous materials conditions in the immediate area. These options do not affect any known contaminated properties or require that a large number of improvements be acquired by WSDOT. The fact that a small number of improvements will be acquired decreases the possibility of encountering unknown contamination during construction. Due to the relatively low risk posed by either of these interchange options, either choice is preferable in comparison to the Freeman Road Interchange Option.

- **SR 161 Interchange Options:**

  The three Interchange Options for the SR 161/SR 167 Interchange are: The Urban Option, Diamond Low Option, and Diamond Medium Option. The only hazardous material site concern included in all three SR 161 interchange options is the SR 167/20E steel bridge. The steel bridge is covered with lead based paint, and the structure will be removed in each of the three interchange options (please see Section 3.3.2 for explanation of removal options for the SR 167/20E steel bridge). Since the bridge will be removed and the possibility of encountering unknowns in the immediate area is relatively the same for each option, the three options do not appear to substantially differ from each other based upon current hazardous materials issues.

4.2.5 Truck Weigh Stations

It is not likely that construction of the truck weigh stations, near the vicinity of the Puyallup Recreation Center, will result in any hazardous materials impacts to the project. The preliminary design locations of the truck weigh stations are not located within and/or adjacent to any known hazardous materials sites.

4.2.6 Underground Storage Tanks

Due to historic and current activities within the project footprint, it is possible that underground storage tanks may be encountered during excavation activities. Abandoned underground storage tanks may have been properly closed in place, contain free product, or remain empty on a site. Underground storage tanks in residential areas are likely to contain heating oil, whereas tanks located in commercial/industrial areas will typically contain automobile fuel and other petroleum products.

4.2.7 Lead Contaminated Soils

Elevated lead concentrations may be encountered in shallow soil (e.g., upper foot) along Interstate 5 due to historical leaded gasoline exhaust emissions. If contamination is encountered in soils that are to be removed from the right of way, sampling and characterization will need to occur prior to determining an appropriate disposal facility.

4.2.8 Asbestos Containing Materials and Lead Based Paint

There are improvements within the project footprint that may contain both ACM and LBP contamination. A thorough ACM/LBP survey will need to be completed on all improvements that will be acquired and/or demolished by WSDOT prior to construction.

Asbestos was commonly used in a wide variety of building materials during the 1950's and 1960's. Asbestos was used in decreasing quantities from approximately 1970 to 1985. Due to its high thermal resistance, tensile strength, stability, and non-combustible nature, asbestos was used for many years in or on the following materials: Pipes, boilers, ventilation ducts, fireproofing material, acoustic control, floor and ceiling tiles, linoleum, transite, wallboard compound, plaster, caulking, mortor, and shingles.

Improvements constructed prior to 1960 are a potential source of lead based paint. Buildings constructed between 1960 and 1977 are less likely to contain LBP due to the voluntary standard limiting lead content in interior paint in 1966. Lead based paint can be found on doors, windows, and cabinets. Although it is unlikely that LBP will be encountered in walls or ceiling tiles, interior and exterior walls can be covered with LBP.

If WSDOT acquires a portion or all of an improvement suspected of containing ACM/LBP, WSDOT will need to properly abate and dispose of any existing ACM and LBP contamination prior to the commencement of construction. Depending upon the lead

levels in the demolition debris, some debris may need to be disposed of as dangerous waste, which would require notification to Ecology.

4.2.9 Hazardous Materials Spills

Accidental hazardous materials spills may occur due to construction activities throughout the project footprint. Construction sites involve various activities, equipment, and materials that can result in a release of hazardous materials into the environment. Traffic detours and lane closures can increase the risk of accidents that cause spills of hazardous materials or substances into the environment. The four areas where spilled hazardous materials have the highest adverse affect on water resources within the project footprint include areas near surface waters, stormwater catch basins, the critical aquifer recharge area, and wellhead protection zones. Releases of relatively small amounts of chemicals to the ground can result in rapid migration to the underlying water table estimated to be between 2 to 15 feet bgs throughout the project footprint. Additionally, specific information on environmentally sensitive areas is contained within the Water Resources Discipline Study.

4.3 Secondary Impacts

Secondary impacts are defined as impacts that are "caused by an action and are later in time or farther removed in distance but are reasonably foreseeable." These impacts, which usually result from the initial action, include changes in land use, water quality, social issues, and population density.

It is not anticipated that there will be any secondary impacts related to hazardous materials as a result of the SR 167 project. Impacts caused by the construction of the SR 167 project are either cumulative or operational in nature. Cumulative and operational impacts are discussed in the following two sections of the discipline study.

4.4 Cumulative Impacts

Cumulative impacts are those that "result from incremental consequences of an action when added to other past and reasonably foreseeable future actions." The cumulative effects of an action may be undetectable when viewed in the individual context of direct, and even indirect impacts but can, nonetheless, add to other disturbances and eventually lead to a measurable environmental change.

There are several active or proposed actions in the project area. While none of these projects are dependent on the construction of the SR 167 project, they will benefit from implementation of this proposed action. The projects are summarized below:

- Rapid expansion of shipping operations at the Port of Tacoma. To accommodate the anticipated increase in container volumes, the Port plans to expand existing

terminals and develop terminals for new clients. Simultaneous with the terminal expansions, the Port plans infrastructure improvements for waterways, rails, and roads;

- Construction of Freight Action Strategy for Seattle-Tacoma (FAST) Corridor Improvements will include the Port of Tacoma Road Grade Separation Project and the Shaw Road Grade Separation Project in Puyallup;

- Industrial/manufacturing and commercial development of vacant, buildable parcels in Fife and the Puyallup River Valley. An example of the type of development that will occur in this area includes a proposed CMC Heartland Development of 850 homes and condominiums and a 150-bed assisted-living facility in Fife;

- Existing Burlington Northern Santa Fe (BNSF) tracks and the Amtrak station are used for the Sound Transit Commuter Rail from Seattle to Tacoma. The ultimate commuter rail line will be located on the south side of Freighthouse Square where the Tacoma Station is located. Operation of the commuter rail line began in September 2000;

- Development of Puyallup Tribe properties in the Port of Tacoma area as well as the Puyallup River Valley;

- Active cleanup of hazardous materials on the west side of the Thea Foss Waterway, by the Thea Foss Waterway Development Authority, as part of a long-range plan for commercial and recreational development. Planned uses include a museum, restaurants, office space, hotel use, and an esplanade. Construction is planned in phases between 2000 and 2010;

- Development and implementation of remedial action plans for cleanups of listed waterways with the Commencement Bay/Nearshore Tideflats Superfund site. The listed waterways within the Superfund site include: St. Paul Waterway, Sitcum Waterway, Thea Foss and Wheeler Osgood Waterways, Hylebos Waterway, and Middle Waterway;

- Planned transportation system improvements as identified in the Pierce County Six Year Improvement Program, including: 1) Widening and reconstruction of Canyon Road to extend the road north from Pioneer Way to the proposed SR 167 footprint, 2) Construction of a Puyallup River crossing connecting Canyon Road and 70th Avenue in Fife, 3) Widening and reconstruction of Valley Avenue from Freeman Road East to 20th Street East;

- Planned transportation system improvements as identified in the WSDOT Highway System Plan and Puget Sound Regional Council Destination 2030, including: 1) Widening SR 161 from 36th Street to I-5, 2) Construction of Core

HOV lanes along I-5 from SR 512 to Seattle, 3) Construction of Core HOV lanes along SR 167 from Puyallup to Seattle, 4) Widening of SR 16 from Tacoma Narrows Bridge to I-5, including improvements of the I-5/SR 16 Interchange.

An overall beneficial cumulative impact to the area surrounding the SR 167 project footprint will result from the cleanup of contaminated properties to be acquired by WSDOT. The development of the projects listed above will require that contaminated sites within the immediate area be remediated so that construction activities can occur in compliance with state and federal environmental regulations. The SR 167 project could also have a cumulative impact on the active cleanup of the listed waterways within the Commencement Bay/Nearshore Tideflats Superfund Site. Sites that are cleaned up due to the SR 167 project would no longer be a contributing factor to contamination within the listed waterways of the Superfund site. Finally, when SR 167 is completed, mechanisms should be in place that would allow for the detention of contaminants within the surface runoff from impervious surfaces. It is not anticipated that there will be any detrimental cumulative impacts related to hazardous materials from the construction of the SR 167 project.

4.5 Operational Impacts

Construction of the project would improve traffic operations along the entire project corridor. This would ultimately serve to reduce the risk of accidents, including those involving hazardous substances, and decrease the amount of harmful substances that enter soil and water resources within the project footprint.

Impacts of hazardous materials and waste from normal operations of SR 167 would primarily be associated with runoff of contaminants entrained in stormwater. Contaminants likely to be in stormwater runoff include fuel, lubricants, heavy metals compounds from tires, and automobile engine coolants such as ethylene glycol. Stormwater and water quality treatment facilities should be designed to collect and retain pollutants from traffic operations. Additional operational impacts may include herbicides used as part of WSDOT's roadside vegetation management program. Because operational impacts related to hazardous waste and water are primarily associated with stormwater quality, these issues are addressed in more specific detail within the Water Resources Discipline Study.

4.6 Potential Regulatory Considerations

A variety of federal, state and local regulations relative to hazardous substances may impact the construction project. Regulatory requirements most likely to affect the project and their potential impacts are briefly discussed below.

Model Toxics Control Act (MTCA) Regulations (WAC 173-340)

The MTCA will apply to any site identified with environmental contamination that may pose a threat to human health and/or the environment during this project. MTCA establishes the acceptable cleanup limits for contaminated media. Any necessary cleanup is likely to be accomplished during construction as an independent action by WSDOT, with technical review by the Department of Ecology on an as-needed basis. Washington Administrative Code (WAC) 173-340-450 sets forth the requirements for addressing releases that may pose a threat to human health or the environment from underground storage tanks. An overview of the cleanup standards is detailed in WAC 173-340-700. Groundwater and soil cleanup standards are listed in WAC 173-340-720 and WAC 173-340-740 respectively.

New amendments to MTCA have been adopted and became effective August 15, 2001. There are some new amendments that may have an impact on the project if contamination is encountered during construction activities. Under Method A, some cleanup levels for soil and groundwater contamination have either increased or decreased. New cleanup standards for Methyl Tertiary-Butyl Ether (MTBE) and Naphthalenes in soil and groundwater have been added to the regulation. A new amendment requires that vapor and dermal exposure pathways be evaluated when establishing soil cleanup levels. To establish cleanup levels (except Method A), a terrestrial ecological evaluation has been added to MTCA to determine if a release to soil poses a threat to the terrestrial environment. The terrestrial environment includes wildlife, plants, and soil biota. The Department of Ecology has also replaced the "100 X groundwater" methodology with fate and transport models to evaluate the soil-to-groundwater exposure pathway. These revisions to MTCA may result in increased costs associated with site characterization and cleanup.

Underground Utilities (RCW 19.122)

There are multiple operating utilities that exist within the project footprint. Revised Code of Washington (RCW) 19.122 states that an excavator shall provide notice of the scheduled commencement of excavation to all owners of underground facilities through a one-number locator service. The RCW also states that all owners of underground facilities within a one-number locator service shall subscribe to the service. Notice needs to be communicated to the locator service no less than 2 days and no more than 10 days prior to the commencement of excavation activities. If the excavator discovers utilities that were not identified or damages a utility, the excavator will stop work and notify the locator service and the owner of the utility service if possible. If the damage causes an emergency situation, the excavator shall also alert the appropriate public health agencies and take all steps necessary to ensure public safety. A failure to notify the locator service of damage to a hazardous liquid or gas pipeline is subject to a civil penalty of not more than ten thousand dollars for each violation. Any excavator who willfully or maliciously damages a field-marked underground facility shall be liable for triple the costs incurred in repairing or relocating the facility.

State Dangerous Waste Regulations (WAC 173-303).

Waste designation procedures are the most likely portion of this regulation that could impact the project. Any contaminated materials generated during the construction project, including soil, water, and debris, will have to be properly designated prior to disposal. In addition, wastes generated by the contractor during construction will require proper designation prior to disposal. WAC 173-303-070 through 173-303-110 includes the specific regulations that identify dangerous waste characteristics and criteria. The requirements for generators of dangerous waste are included in WAC 173-303-170 through WAC 173-303-230. A transporter of dangerous waste must comply with the procedures listed in WAC 173-303-240 through 173-303-250.

WAC 173-303-145 lists the reporting requirements for spills and discharges into the environment, except when otherwise permitted under state or federal law. This section of the WAC applies "when any dangerous waste or hazardous substance is intentionally or accidentally spilled or discharged into the environment such that human health or the environment is threatened, regardless of the quantity of dangerous waste or hazardous substance." This portion of the regulation also details the required procedures for notification and mitigation should a spill occur on site.

Endangered Species Act (ESA)

The Endangered Species Act regulates a wide range of activities affecting plants and animals designated as "endangered" or "threatened". The ESA states that it is unlawful to "take" any animal listed as an endangered species. The ESA defines "endangered" as an animal or planted listed by the regulation that is in danger of being extinct. A "take" under ESA is broadly defined to include, "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect," or an attempt to engage in such conduct. Endangered species within the Puyallup Watershed include Bull Trout and Puget Sound Chinook Salmon, as well as other "threatened" species.

Solid (Non-Dangerous) Waste Disposal (RCW 70.95, WAC 173-304)

Under the State Solid Waste Management Act, RCW 70.95 states that primary responsibility for managing solid waste is assigned to local government. The state, however, is responsible for assuring the establishment of effective local programs throughout the state.

The local jurisdiction's Health Department regulates the handling and disposal of solid waste. Identifying the appropriate waste disposal facility is most likely the portion of local solid waste regulation that could impact the project. The local Health Department determines whether a waste material is acceptable at one or more of the public and private solid waste facilities in the county. In some cases, testing may be required prior

to disposal. Even waste that is being shipped to a disposal facility out of the county, and soil treatment facilities, falls under the jurisdiction of the local Health Department.

WAC 173-304 lists the Minimum Functional Standards for Solid Waste Handling. WAC 173-304-200 designates the on site containerized storage, collection, and transportation standards for solid waste. The regulations apply to all persons storing containerized solid waste that is generated on site. Revisions are anticipated for WAC 173-304 and the final revised rules should be reviewed prior to the commencement of construction. The updated solid waste rule is likely to include new provisions for demolitions and inert waste streams.

Water Quality Standards for Surface Waters (Chapter 173-201A WAC)

WAC 173-201A-040 is the section of the Water Quality Standards that specifically deals with toxic substances within surface waters of the state. The WAC indicates that toxic substances, above natural background levels, shall not be introduced into waters of the state if: 1) The substance will singularly or cumulatively adversely affect characteristic water uses, 2) Cause acute or chronic toxicity to the most sensitive biota dependent on the water, or 3) Adversely affect public health. The Department of Ecology shall employ or require chemical toxicity testing and biological assessments as appropriate to determine compliance with the above-mentioned requirements. WAC 173-201A-160 lists the primary means for controlling municipal, commercial, and industrial waste discharges through the issuance of waste disposal permits.

Wastewater Discharges to Ground (WAC 173-216).

The State Water Discharge Permit program includes a variety of exemptions, most of which relate to discharges that are permitted under an National Pollution Discharge Elimination System (NPDES) permit or are otherwise authorized by a publicly owned treatment works (POTW) with an authorized pretreatment program. This regulation may apply to stormwater detention basins planned on the project if the water contains unacceptable concentrations of polluting materials.

Wellhead Protection

The regulation dealing with Wellhead Protection areas that will most likely affect this project is the Pierce County Ordinance regulating Critical Areas. According to the Aquifer Recharge Area Chapter 18E.50 of Development Regulations – Critical Areas, the creation of impervious surfaces will be minimized during roadway construction. The ordinance also indicates that as much permeable space as possible shall be provided during construction activities.

Safety Standards for Construction Work - Lead (WAC 296-155)

WAC 296-166 indicates that workers may not be exposed to lead at concentrations greater than fifty micrograms per cubic meter of air ($50\mu g/m^3$) averaged over an 8-hour period. WAC 296-166 also outlines the personal protective equipment that shall be given to employees as well as medical surveillance procedures that are to be implemented for exposed personnel.

National Emission Standards for Hazardous Air Pollutants (NESHAP) (Code of Federal Regulations, Title 40, Volume 5, Parts 61 to 71)

The Environmental Protection Agency's rules concerning the removal and disposal of asbestos-containing materials (ACM) were issued under NESHAP. NESHAP requires a thorough inspection for friable and nonfriable ACM within a structure prior to demolition activities. An accredited inspector as required by the Asbestos Hazard Emergency Response Act (AHERA) must conduct all inspections. The NESHAP regulation also includes specific notification, work practice, packaging, labeling, and disposal requirements.

The Puget Sound Clean Air Agency (PSCAA) requires that a notice of intent be submitted prior to beginning any work on an asbestos demolition. The only exception is asbestos projects involving less than 48 square feet and the removal of nonfriable asbestos containing roofing material. An AHERA building inspector or competent person must make the determination if it is nonfriable material. There is a notification waiting period and fee that will need to be considered prior to planning any abatement work. Asbestos removed from buildings prior to demolition must be disposed in a landfill permitted to receive ACM.

General Occupational Health Standards – Asbestos (WAC 296-62 Part I-1)

WAC 296-62 requires that prior to commencement of work an owner must conduct a good faith inspection to determine whether materials to be worked on or removed contain asbestos. An accredited inspector must conduct the good faith inspection. WAC 296-62 Part I-1 requires that an employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter (0.1f/cc) of air as an eight-hour time-weighted average. Besides the permissible exposure limit, the regulation also requires appropriate respiratory protection as well as exposure assessment and monitoring.

Hazardous Waste Operations and Treatment, Storage, and Disposal Facilities (WAC 296-62 Part P, RCW 49-17)

WAC 296-62 Part P includes all of the required procedures for work involving hazardous materials. Due to the possible impacts indicated above for specific sites, there are sections of WAC 296-62 that are of key importance for this project.

WAC 296-62 Part P also details the requirements for handling drums and containers. Unlabeled drums and containers must be considered to contain hazardous waste and handled accordingly until the contents are positively identified and labeled. Drums and containers that cannot be moved without rupture, leakage, or spillage must be emptied into a sound container. Personal protective equipment selection protocol is outlined in WAC 296-62-30605. The training requirements for site personnel are included within multiple sections of Part P depending upon the designation of the contamination on site.

Puget Sound Clean Air Agency (PSCAA), Regulations 1-3

Pierce County follows the air quality requirements included in the Puget Sound Clean Air Agency regulations. The PSCAA includes the counties of Pierce, King, Snohomish, and Kitsap. The regulations adopted by PSCAA control the emissions of air contaminants within all of the above-mentioned counties. The PSCAA regulations carry out the requirements of the Washington Clean Air Act and the Federal Clean Air Act.

Underground Storage Tank Statute & Regulations (RCW 90-76, WAC 173-360)

The purpose of the above regulations is to address the serious threat posed to human health and the environment by leaking underground storage tank systems containing petroleum and other regulated substances. The regulations describe the enforcement, notification, and reporting requirements for underground storage tanks. The regulations also detail the performance standards and operating and closure requirements.

4.7 Recommendations for Further Investigation

This section identifies possible liability issues and offers recommendations for additional investigations to better define the potential for environmental contamination associated with acquisition properties and worker safety concerns.

4.7.1 Walk-through reconnaissance

Any commercial/industrial/residential building that will be demolished should undergo a more thorough site reconnaissance prior to acquisition. The site reconnaissance should occur in advance of the desired acquisition in order to minimize cleanup liability incurred by WSDOT. EAO recommends a brief walk-through of each facility to observe processes and activities that occur at the facility. For sites where additional sampling is recommended (see below), this is a good opportunity to select likely sampling locations that will best fill existing data gaps. This does not need to be a detailed evaluation of the facility operation. Rather, it should focus on items and areas that could present a significant liability or cost to WSDOT. Example components of the site reconnaissance that may pose liability for WSDOT include:

- Inspect building materials to look for potential asbestos containing materials and lead based paint;

- Note any stored products and/or accumulated problem wastes/products (e.g., petroleum products, chemicals, solvents);

- Observe facility processes looking for activities that may contribute to environmental degradation, such as sump locations and contents, waste and product storage areas and procedures, and disposal practices;

- Look for the presence of ASTs (above-ground storage tanks) and USTs (underground storage tanks);

- Observe if there are visual indications of environmental contamination (e.g., stains, discoloration, distressed vegetation);

- Determine if sampling of soil and/or groundwater is necessary.

4.7.2 Site Reconnaissance/Preliminary Site Investigations/Sampling Activities

Based upon the proposed mainline design, EAO recommends that a site reconnaissance be conducted on the following sites:

Table 3, Site Investigations

SITE
USG Highway 99 Site
Rick Sexton Drums
Firwood Gym
Valley Avenue Residences
Jesse Engineering
Vitamilk Dairy – Fife
Richard Johnson Property
S&J Trucking
Don Olson Construction

If the site reconnaissance indicates that there are aspects of a property that warrant further investigation (See Section 4.7.1), then a Preliminary Site Investigation should be conducted for the property. The purpose of a PSI is to confirm suspected environmental conditions in work areas and at properties to be acquired. It is not intended to characterize the nature and extent of contamination. Investigations should be conducted based on newly adopted MTCA cleanup standards as construction will occur after the scheduled implementation date of August 2001. Sample locations at each site will

depend upon the specifics of the property acquisition and the preferred interchange options. If there are changes to the proposed mainline, a site reconnaissance should be conducted on any properties listed in Table 1 and Table 2 that are not listed above. Preliminary Site Investigations should be completed prior to publication of the final Environmental Impact Statement.

Along with the specific sites listed above, it will be necessary to conduct sampling of possible lead contaminated soils along I-5. To assess lead deposition from historical use of leaded gasoline, soil samples should be collected from representative locations throughout the portions of Interstate 5 that are affected during the project. The number of samples and sample locations should depend upon final design of the I-5/SR 167 interchange. The samples should be collected on existing ROW and/or adjacent properties to be acquired for the project. The samples should be analyzed for total and leachable (TCLP) lead. These data can be used to determine appropriate handling and disposal requirements for lead-contaminated soil.

It is recommended that sampling occurs at the I-5/54th Avenue East Interchange and the southeast corner of the I-5/Porter Way Interchange if 1) WSDOT will acquire properties outside of the current ROW and/or 2) It is determined that dewatering activities will need to occur in that portion of the project footprint. EAO recommends that sampling be conducted due to potential for petroleum contamination groundwater. Samples should be analyzed for petroleum constituents and total lead. These data can be used to determine appropriate construction techniques prior to the commencement of excavation activities.

Pre-construction investigation and testing is needed to determine the location and quantity of asbestos containing materials and lead based paint so that these wastes can be properly abated prior to demolition. Proper asbestos and lead based paint sampling and abatement may be necessary for some of the site specific structures listed in Section 4.2. The suspected structures are: Firwood Gym, Vitamilk Dairy, Rick Sexton Drums, Jesse Engineering, the Valley Avenue Residences, and Don Olson Construction. The need for sampling and abatement will depend upon whether the site in included within the final design and if site reconnaissance observations indicate the structure is likely to contain ACM and LBP.

5.0 MITIGATION

This section presents measures that should be considered to avoid or otherwise control and manage environmental issues that may be encountered in the expanded ROW and construction area. With the exception of the SR 167 project footprint and multiple interchange options, available roadway design data was limited or absent. As such, using information available from other similar sites along with best professional judgment, assumptions were made about the environmental quality of the media to be handled.

5.1 General

Because this project primarily entails filling rather than excavation, WSDOT planners should consider conducting any necessary cleanup activities *prior* to construction in order to mitigate long-term cleanup costs. If post-construction cleanup is required after fill has been placed, associated costs may be exorbitant.

To mitigate cleanup costs incurred by WSDOT, the results of pre-acquisition site investigations should be used to assign fair market property values that consider potential long-term cleanup costs.

5.2 Environmental Media

Three types of environmental media may require special consideration during construction: Soil, groundwater, and surface water. Known areas of contaminated soil, groundwater, and surface water may be encountered within areas of planned construction. There is also a high likelihood that ACM and LBP may be encountered at acquisition properties. Mitigation options for each of the three environmental media, as well as construction debris and other possible impacts, are discussed in the following subsections.

5.2.1 Soil

Space on construction sites will likely be constrained and quick decisions will need to be made regarding stockpiling and disposal so as to minimize delays to earthwork contractors. If soil disposal issues are not addressed in a timely manner, schedule delays and additional construction costs may occur.

Contamination in soils should be evaluated relative to MTCA Method A cleanup levels. New amendments to MTCA have been adopted by Ecology and are scheduled to take affect on August 15, 2001. Revised regulations should be visited prior to determining the final disposition of soils.

Method A levels are usually relatively conservative and do not account for site-specific conditions in establishing the cleanup level. Soils cleanups using the Method A approach will generally result in a greater amount of soil having to be remediated. However, the MTCA Method A approach is easy to implement and laboratory testing and data analysis costs are relatively inexpensive. The Method A approach should be considered in locations that contain small amounts of contaminated soil, areas where soils need to be removed and disposed of quickly, and cases where contaminated soil can be easily utilized as subgrade road material.

Contaminated soils may require stockpiling and testing to assess the regulatory classification of the soil and the associated most cost-effective management option. Ecology's 1995 *Guidance for Remediation of Petroleum Contaminated Soils* is a guidance document that can still be used although it does not account for higher cleanup levels provided for in the amended regulations. Revised Ecology guidance for remediation of soils is anticipated within the next two years. Contaminated soils in excess of landfill requirements and/or containing contaminants above maximum site-specific, risk-based action levels will need to be transported to the nearest treatment facility for treatment and disposal. Soils containing contamination below MTCA cleanup levels may, in some cases, be left on site and used for general fill material (i.e., placed under roadways), if suitable fill capacity exists and the soils meet geotechnical fill requirements. This option should be carefully considered because many facilities that will normally take "clean soil" will not take this soil because it has detectable concentrations of contaminants. The final selection of the off-site disposal method for contaminated soil will depend on the contaminant concentration, and the volume, moisture content, and grain size of the soil.

If contaminated soils fail the hazardous waste toxicity characteristics (as determined using the Toxicity Characteristic Leaching Procedure -TCLP), the soils will need to be handled as Washington State dangerous waste. The generator of such waste must obtain an ID number for each "site" (i.e., location). The ID number is obtained by submitting a Form 2 Notification of Dangerous Waste Activities to the Department of Ecology (See Appendix C for a copy of Form 2). This can be completed after the soil is determined to be dangerous waste for unanticipated soils. If it is known that dangerous waste soils are present, the project should obtain an ID number, along with a determination of soil handling requirements. In such cases it is often easiest to load soil directly into trucks for shipment to the treatment location/facility.

Contaminated soils will require stockpiling and testing to assess regulatory classification of the soil and the associated most cost-effective management option. The following potential management options are available:

- Soils containing contamination below MTCA cleanup levels may be placed (capped) under roadways, if suitable fill capacity exists and the soils meet geotechnical fill requirements. This option adds no cost to construction;

- Contamination in excess of the fill requirements and/or containing contamination above MTCA cleanup levels, but below the dangerous waste criteria, may be transported to a regional solid waste landfill for disposal;

- Contaminated soils designated as dangerous waste may be transported to a designated landfill that is permitted to handle dangerous waste for stabilization and disposal.

There are several companies that can dispose of non-hazardous or hazardous waste in the vicinity of the project footprint. For example, TPS Technologies (TPS), located in Tacoma, is a thermal disposal facility with specific waste characterization and acceptance procedures. TPS will not accept soils that designate as state dangerous waste or federal hazardous waste. For example, the following are the maximum acceptable concentrations for the TPS Technologies facility:

- TPH (Total Petroleum Hydrocarbons): No limit on acceptance

- PAH: No limit on acceptance

- Chlorinated Compounds: 100 ppm total chlorinated

- PCB Compounds: 49 ppm total PCB

- Other contaminants of concern (e.g., metals) have maximum acceptable concentrations depending on the volume of soils to be treated and type of contaminant. These types of contaminants are treated on a project-by-project basis.

A second example of a local disposal facility is Rabanco Regional Disposal Company. Rabanco can load the contaminated soil into trucks, haul the soil to Tacoma for transfer into train cars, and then transport the soil via rail to the appropriate landfill. Rabanco's criteria for analytical parameters are determined upon required include:

- Flashpoint;

- Lead, Total;

- Total Organic Halogens;

- TCLP metals, cadmium, lead, and chromium;

- BTEX (Benzene, Toluene, Ethyl Benzene, Xylene); and

- PCB's.

Rabanco's maximum allowable levels for contamination are specific to each type of contaminant. The seven categories of contaminants are: TCLP Metals, TCLP Volatiles, TCLP Semi-Volatiles (Base Neutrals), TCLP Semi-Volatiles (Acid Compounds), TCLP Herbicides, TCLP Pesticides, and a general category which includes TPH and PCBs. Some of the allowable levels (e.g., TPH) can vary depending upon the landfill that will handle the disposal of materials.

If the contaminated soil contains regulated hazardous waste, a disposal company that is permitted to handle that type of soil will need to be contacted. Each of the disposal facilities will require sampling and other specific procedures as developed by each company. Two common disposal facilities for this type of media in Western Washington are Philip Services and Ensco, Inc. If hazardous waste is generated during construction, a Form 2, Notification of Dangerous Waste Activities, will need to be submitted to the Department of Ecology.

Pre-construction soil characterization would allow the project office to appropriately address soil management and disposal requirements in a special construction bid specification (See Appendix D for example specification). The specification may require a contaminated media contingency plan. The purpose of this plan is to identify procedures and chains of responsibility to effectively manage contaminated soil as it is encountered during construction so that construction delays can be kept to a minimum. Contaminated media contingency plans should be comprehensive and address issues such as field screening methods, notification requirements, soil stockpile management, and appropriate disposal methods and facilities.

5.2.2 Surface Water

Mitigation measures to minimize potential impacts to surface water resources include erosion and spill prevention controls. The plans should specify control methods, emergency response, notification, and chain of command. See section 5.2 for Spill Prevention Control and Countermeasure (SPCC) Plan requirements.

Erosion controls address the procedures, equipment, and materials necessary to avoid erosion during excavation and stockpiling work. Contractors should be required to address the diversion of stormwater, use of storm sewer inlet catch basins and soil berms, and the covering of soil stockpiles to prevent erosion. The WSDOT Highway Runoff Manual provides specific guidance erosion controls.

5.2.3 Groundwater

When final design of the project footprint is completed, it may be possible that portions of the construction project will require dewatering. It may be impractical to treat the volumes of water at staging areas within the project footprint. Depending on local conditions, it may also be infeasible to discharge to the sanitary or stormwater sewer

system. For this reason, regardless of underlying groundwater quality, alternative construction techniques that minimize or avoid dewatering (e.g., sheet piling, cased piers, driven piling, spread footings) should be evaluated.

If the contaminated groundwater contains regulated hazardous waste, a disposal company that is permitted to handle that type of water will need to be contacted. Each of the disposal facilities will require sampling and other specific procedures as developed by each company. Two common disposal facilities for this type of media in Western Washington are Philip Services and Ensco, Inc. If hazardous waste is generated during construction, a Form 2, Notification of Dangerous Waste Activities, will need to be submitted to the Department of Ecology.

In the event that construction dewatering flows cannot be minimized sufficiently and disposed of within the city sewer system, on-site treatment and short-term disposal in local surface water drainage may become necessary. The general NPDES construction permit for the entire SR 167 project should address the specific requirements of groundwater disposal off-site. The City of Fife will handle questions regarding discharges to the sanitary and stormwater systems on a case-by-case basis. See the Water Resources Discipline Study for detailed information on the NPDES construction permit.

5.3 Demolition Debris

With the exception of recycling, the least expensive disposal option for demolition debris would be at a lined demolition debris landfill. WSDOT could be liable for future cleanup actions related to leaching contaminants in an unlined demolition debris landfill. The determination to use a lined or unlined landfill should be based on the leachability characteristics of the debris. Contacting the landfill to inquire about potential restrictions regarding disposal of demolition debris is advisable.

EAO anticipates that building demolitions will generate non-hazardous construction debris as its primary waste stream. For the most part, this material should include metal, concrete, wood and wallboard. There is often an economic benefit in recycling some building components. Separating and recycling demolition debris can dramatically reduce demolition costs. In addition to a cost savings, the liability associated with waste disposal is reduced or eliminated through recycling.

The following common debris items can be segregated and recycled as scrap: Steel posts, beams, stairs, railings, door, windows, and aluminum siding. Concrete can be used as fill material in some applications. Gypsum wallboard can also be recycled. Structural wood can also be recycled, and there may be a market for recycled doors, windows, and light fixtures.

Demolition debris is not discussed any further in this report as solid waste is not a cost associated with hazardous materials with the exception of asbestos containing materials and lead based paint (See Section 5.5).

5.4 Spill Prevention Control and Countermeasure Plan

The SPCC plan is designed to mitigate impacts to soil, surface water, and groundwater. The SPCC plan addresses procedures, equipment, and materials used in the event of a spill of contaminated soil, petroleum products, contaminated water, or other hazardous substances. According to General Special Provision (GSP) #071502.FR1, contractors should be responsible for providing WSDOT a SPCC Plan on all WSDOT projects prior to commencing work. Revisions are anticipated for the SPCC plan specification with the final revised specification scheduled to be published in December 2001. Please see Appendix E for General Special Provision #071202.FR1.

All SPCC plans must include the following elements:

- Introduction
- SPCC Plan Elements
- Site Information
- Management Approval
- Site Description
- Planning and Recognition
- Spill Prevention and Containment
- Spill Response
- Reporting
- Program Management
- Attachment A: Emergency Action Plan
- Attachment B: Site Plan
- Attachment C: Inspection and Incident Report Forms

5.5 Asbestos Containing Materials/Lead Based Paint

Structures containing lead based paint should be sampled to determine the characteristics of the debris for disposal purposes. Lead based paint waste may need to be analyzed for leachability characteristics prior to determination of an appropriate disposal facility. Mitigation for asbestos containing materials includes removal and disposal of asbestos containing materials prior to demolition. All sampling and abatement procedures must comply with NESHAP and state regulations, including permissible exposure limits and personal protective equipment requirements. Labor and Industries requires that personnel not be exposed to levels of ACM and LBP above permissible exposure limits. Washington State regulations also require that appropriate personal protective equipment is donned by personnel prior to contact with both ACM and LBP. Worker and public safety concerns should be addressed through special bid specifications. Please see Appendix F for asbestos/lead abatement example specification.

For the SR 167/20E steel bridge, containment below the bridge will be necessary to stop loose flakes and paint chips from entering the Puyallup River. A blast medium like Blastox should help to minimize the amount of hazardous waste to be disposed of off site. Blastox encapsulates the lead allowing disposal at a demolition landfill. Lead based paint debris with elevated concentrations of leachable lead will need to be disposed of at a lined landfill permitted to accept hazardous waste.

5.6 Underground Utilities

All utility locations should be identified during the design phase of the project. In addition, less than two days and no more than ten days prior to excavation commencing, the Underground Utility Locate Center must be notified. The telephone number for the locate center is 1-800-424-5555. The locate center will then notify all of the necessary utility owners so that utility sites are marked within the project footprint.

The Underground Utility Locate Center will notify Olympic Pipe Line that the pipeline needs to be located because of planned excavation activities. Olympic Pipe Line will then provide personnel to be on site while excavations are occurring near the location of the pipeline. The personnel on site from Olympic Pipe Line need to be coordinated with to ensure that construction activities do not negatively impact the pipeline. During the final design phase of the project, Olympic Pipe Line personnel are willing to look over design plans and provide feedback. This information will help to develop appropriate construction specifications for the project. The contact at Olympic Pipe Line for the Fife area is Bill Mulkey at 425-235-7750.

5.7 Worker and Public Health and Safety

Improper use or management of hazardous substances brought to the work site by the contractor can, and often does, result in unacceptable work exposures. Pre-existing site conditions may also have the potential to impact worker safety. Proper employee training, contaminated media contingency planning, and secondary containment for hazardous materials should be required of the contractor. Labor and Industry regulations require that unlabeled drums and containers be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

With respect to the public, attention to the following measures should minimize potential public health and safety concerns:

- Contaminated environmental media and hazardous substances should be contained so they are not readily available to the public and/or public access should be restricted;

- Transportation of contaminated environmental media and hazardous substances on public right-of-way should be packaged and shipped in accordance with the

U.S. Department of Transportation (DOT) requirements to reduce the potential for releases.

If a limited Preliminary Site Assessment and/or ambient air monitoring indicate fugitive dust is an issue, 1) Workers must be notified, 2) Air monitoring during construction should occur, and/or 3) Workers may be required to wear personal protective equipment during construction, as appropriate, 4) Dust suppression techniques may need to be implemented on the project site.

When working with contaminants or unknowns, permissible exposure limits have to be implemented. Workers' exposures to any regulated contaminant should not exceed the permissible exposure limits based on a regular 8-hour working day. According to L&I requirements, workers must be provided with personal protective equipment that is appropriate for site conditions. Section 3.4 contains a summary of the regulations that impact worker safety and health requirements. Those regulations that deal primarily with worker's health and safety requirements include: State Dangerous Waste Regulations (Chapter 173-303 WAC), Safety Standards for Construction Work (Chapter 296-155 WAC), National Emission Standards for Hazardous Air Pollutants (Code of Federal Regulations, Title 40, Volume 5, Parts 61 to 71), and General Occupational Health Standards (Chapter 296-62 WAC).

A worker safety concern on the SR 167/20E bridge is the presence of histoplasmosis. According to the National Institute for Occupational Safety and Health, before an activity is started that may disturb any material that might be contaminated by *H. capsulatum*, workers should be informed in writing of the personal risk factors that increase an individual's chances of developing histoplasmosis. Such a written communication should include a warning that individuals with weakened immune systems are at greatest risk of developing severe and disseminated histoplasmosis if they become infected. These people should seek advice from their health care provider about whether they should avoid exposure to materials that might be contaminated with *H. capsulatum*.

Notification of the existence of histoplasmosis on the bridge could mitigate the health hazard to personnel. It is recommended that an inspection of the bridge be conducted in advance to determine if guano is present so that the proper removal procedures can occur prior to and/or during demolition.

5.8 Underground Storage Tanks (USTs)

USTs can pose environmental problems as well as create a threat to worker safety and health. There are suspected USTs within the project footprint, and it is possible that they may be encountered during construction activities. It is recommended that a magnetometer survey be conducted prior to construction activities if it is suspected that a UST exists on site. Department of Ecology's Underground Storage Tank Statute and Regulations (Chapter 90-76 RCW, Chapter 173-360 WAC) should be followed when removing an UST with a regulated substance from the project footprint.

A suspected release from an UST shall be reported to Ecology within 24 hours of the discovery of the release. A certified UST supervisor shall complete permanent tank closures. The site assessment required under WAC 173-360-390 shall be performed after notifying the department or delegated agency but prior to completion of the permanent closure or a change-in-service. To permanently close an UST system, the certified UST supervisor shall empty and clean the tank by removing all liquids and accumulated sludges. All tanks taken out of service permanently shall either be removed from the ground or filled with an inert solid material. All piping shall either be capped (except vent lines) or removed from the ground.

5.9 Cumulative and Secondary Impacts

No secondary or cumulative impacts are expected from the SR 167 project. Rather, a net benefit to ongoing development projects in the same area is expected from the roadway project, including any additional removal and cleanup of contaminated materials. It will be important, however, to coordinate the design and construction plans with the on-going project teams to ensure that the design and construction of SR 167 is consistent and that the project does not impact any on-going remedial activities. The implementation of the project should support planned and designated growth within the Puyallup River Valley and Port of Tacoma vicinity.

5.10 Operational Impacts

Because operational impacts related to hazardous waste are primarily associated with stormwater quality, these issues are addressed in the Water Resources Discipline Study rather than in this report.

5.11 Preliminary Cost Estimates

This section presents preliminary cost estimates for recommended additional investigation and remediation associated with construction. Itemized details are presented below. In most cases, cost estimates are based on preliminary roadway design information and best professional judgment resulting from previous experience. Due to project design information being limited, estimates are expressed in unit costs. A cost estimate for a Detailed Site Investigation is not included because one is not recommended at this time.

5.11.1 Site Investigation Cost Estimates

The purpose of a site reconnaissance is to identify potential sources of hazardous substances and/or petroleum products that may have been used at the site or in the surrounding area and adversely impacted the subject property. The results of the site reconnaissance are used to determine whether environmental sampling may be required

prior to WSDOT acquiring the property. As stated in Section 4.7.2, a site reconnaissance should be conducted on all of the sites listed within Table 1 and Table 2 that are within the proposed project footprint. If results of the site reconnaissance indicate that further investigation is necessary, a Preliminary Site Investigation should be conducted to confirm the environmental conditions of the property. The PSI cost estimate includes a walk-through site reconnaissance of the properties as well as sampling activities and laboratory analysis. The estimated costs for a site reconnaissance and possible PSI for the specific sites of interest are included below in Table 4. Actual costs should be based on a detailed scope of work and cost estimate.

Table 4, Estimated Site Investigation Costs*

SITE	RECONNAISSANCE	PSI (if needed)
USG Highway 99 Site	$840	$25,000.00
Rick Sexton Drums	$840	$25,000.00
Firwood Gym	$840	$25,000.00
Valley Avenue Residences	$840	$25,000.00
Jesse Engineering	$840	$25,000.00
Vitamilk Dairy – Fife	$840	$25,000.00
Richard Johnson Property	$840	$25,000.00
S&J Trucking	$840	$25,000.00
Don Olson Construction	$840	$25,000.00
I-5 Soils	$840	$25,000.00

**This table represents sites within the project footprint. If the proposed right of way is altered, and additional sites are selected for acquisition, this cost estimate will change accordingly.*

The total cost for site investigations is estimated to range between $8400 and $250,000. The costs will be $8400 at a minimum in order to conduct a site reconnaissance for each of the properties listed in Table 4. Depending upon those results, a PSI may need to be conducted for each property for a maximum investigation cost of $250,000.

5.11.2 Preliminary Construction Remediation Cost Estimates

Itemized details of cost estimates for construction remediation are presented below. Because roadway design information is limited, only unit costs are provided for each possible project impact. Cost estimates are based on information available from other similar project sites in Washington, along with best professional judgment.

- **Contaminated Soil**

Unit rates for soil management have been estimated for off-site treatment or off-site disposal based on the assumption that non-hazardous contaminated soil would be transported to a thermal treatment facility located in western Washington. The typical unit cost at one of these facilities is $35 ton. Transportation costs are estimated at approximately $10/ton plus a $500 loading fee. These cost estimates do not include soil characterization costs prior to disposal. The characterization costs can differ greatly depending upon the constituent for which the soil is analyzed. Petroleum contamination is one of the most common constituents encountered in soil, and analytical prices are approximately $50 - $80 per sample.

Non-hazardous contaminated soil that cannot be disposed of at a thermal facility (e.g., soil contaminated with metals) will need to be disposed of at a regional landfill. The cost estimate for disposal at one of these facilities is $29/ton combined with a $95/hour transportation cost. Analytical prices for metals contamination range from $70 - $150 per sample depending upon EPA Methods and individual laboratories.

The disposal costs for regulated hazardous waste are considerably more expensive than non-regulated contaminated soil. Philip Services estimates the cost for removal of soil contaminated with hazardous waste to be approximately $397/ton. Costs to transport the soil are approximately $80/hour and are based on portal-to-portal transportation from Tacoma. The cost estimate will differ depending upon the specific characteristics of the soil and the levels of contamination.

The above unit costs assume typical conditions and therefore represent a “most likely” estimate for management, treatment, and/or disposal. These estimates do not include costs for excavation.

- **Contaminated Groundwater**

Unit rates for groundwater management have been estimated for off-site disposal based on the assumption that contaminated groundwater would be transported to an environmental disposal facility in western Washington. The City of Fife will handle discharges to the city stormwater and sanitary systems on a case-by-case basis so unit costs are not estimated at this time for that disposal option. The estimated groundwater disposal costs (including hazardous waste) anticipated during highway construction ranges from $0/gallon (should WSDOT be permitted to allow contaminated groundwater to remain in place) to $3/gallon. Costs can increase depending upon the characterization of the water and the levels of contamination present. Transportation costs can range from $5 to $25 depending upon the location of the appropriate disposal facility.

Characterizations costs are not included in the above disposal costs. The characterization costs can differ greatly depending upon the constituent for which the groundwater is analyzed. Petroleum contamination is one of the most common constituents encountered in groundwater and analytical prices range from $50 - $80 sample. A second common constituent in soil is metal contamination, and analytical prices range from $70-$150

depending upon EPA Methods and individual laboratory prices. Costs to transport the groundwater are about $80/hour and are based on portal-to-portal transportation from Tacoma. The cost estimate can differ depending upon the specific characteristics of the water and the levels of contamination.

The above unit costs assume typical conditions and therefore represent a "most likely" estimate for transportation, treatment, and/or disposal. These estimates do not include costs for dewatering since this cost would be incurred regardless of whether the groundwater was contaminated.

- **UST Decommissioning**

If USTs need to be removed from a site prior to construction, the estimated cost for decommissioning and removal of a UST (1,000 – 5,000 gallon capacity) is approximately $5,000. Decommissioning fees typically include excavation of the tank, sampling of soils within the excavation, and completion of any required reporting requirements. The estimates for UST decommissioning do not include cleanup costs if contamination is encountered within the excavation.

- **Asbestos Containing Materials and Lead Based Paint**

ACM and LBP abatement procedures will typically occur at the same time because abatement for LBP is usually only conducted if a representative sample of construction debris (collected during the survey) fails TCLP testing for lead. Lead abatement occurs while the ACM is removed so that construction debris does not have to be handled as a dangerous waste due to leaching characteristics. The types of debris that typically cause TCLP exceedance for LBP are trim and caulking on doors and windows.

Because data on ACM and LBP were not available for the buildings in the project footprint, a number of assumptions were made to estimate the cost to manage (i.e., survey, abate, and dispose of) ACM and LBP. To determine cost estimates, it is assumed that:

- The average size of residential buildings will be 1,700 square feet;
- The average size of small industrial/commercial buildings will be 4,000 square feet;
- The average size of large industrial/commercial buildings will be 25,000 square feet;
- No previous abatement has occurred in the buildings;
- With the exception of roofing material, ACM will be disposed of at a permitted landfill;

- The asbestos survey cost estimate includes the cost to prepare abatement plans and specifications; and

- The asbestos abatement cost estimate includes the cost to oversee and document abatement and disposal.

The unit cost to survey and abate asbestos is estimated to be:

- $12,000 for residential structures;

- $14,500 for small industrial/commercial structures;

- $66,000 for large industrial/commercial structures.

A cost estimate for the abatement of LBP paint for a residence is approximately $3,000. Based on a structure that is 1700ft^2, the per foot cost for LBP abatement is $1.75/ft^2. That cost can be used to approximate the abatement costs for LBP in industrial/commercial size structures. The costs for abatement can also differ depending on the amounts of LBP located within or on the outside of the structure.

Table 5 lists the specific sites within the proposed mainline that have improvements that may contain ACM/LBP as well as the estimated sampling and abatement costs associated with those properties.

Table 5, Estimated ACM/LBP Costs*

SITE	ESTIMATED ACM/LBP COSTS
Firwood Gym	$16,000
Vitamilk Dairy - Fife	$16,000
Rick Sexton Drums	$12,000
Jesse Engineering	$70,000
Valley Avenue Residences	$45,000
Don Olson Construction	$16,500

**Improvements that are acquired by WSDOT and are not listed as a specific site of interest in this discipline study may contain ACM/LBP. A site reconnaissance should be conducted on any improvement to be acquired by WSDOT to determine if ACM/LBP sampling and abatement is necessary.*

The overall estimated cost for ACM/LBP abatement in the proposed mainline is approximately $175,000. This estimate is based on the apparent size and structure of the improvements as noted during windshield surveys conducted throughout the writing of the discipline study.

As stated in Section 4.0, there are two likely options for the removal/demolition of the SR 167/20E Steel Bridge over the Puyallup River. The key difference between the two options is that only one option requires that lead based paint be removed from the structure prior to demolition. Based on previous WSDOT bridge demolition projects, the option requiring lead removal is approximately $300,000 more than the option requiring no lead removal. The $300,000 includes prep work, including removal of the lead based paint from the structure, disposal, as well as considerations that need to be made for the removed material. The cost for bridge demolition not requiring lead removal is not included here as all costs are related to construction/demolition only.

- **Abandoned/Unknown Materials**

It is likely that unknown materials may be encountered during construction activities within the project footprint. Estimates associated with removing unknown materials from a site depend upon, but are not limited to, the following: 1) Sample analysis to characterize the materials, 2) Management of the materials on site, and 3) Transportation and disposal of the unknown materials. Each of the three costs above can vary greatly depending on the specific material characteristics and the quantity of material to be removed from the site. For this reason, a specific cost estimate associated with abandoned/unknown materials is not provided in this discipline study. Please see cost estimates for specific media listed within 5.10.2 as a basis for estimating unknown costs.

- **Spill Prevention Control and Countermeasure (SPCC) Plan**

WSDOT's construction specification requiring a SPCC plan provides for a lump sum payment for plan preparation and implementation. Typically, the cost to create a SPCC will vary from $500 to $5000 depending upon the contractor and the project size and location. Due to the extent of this project and its proximity to waterways and wetlands, we estimate SPCC plan development should cost closer to $5000. Plan implementation costs will depend on the contractor's diligence to prevent spills. If care is taken to prevent spills, we estimate plan implementation costs should be less than $10,000.

5.12 Regulatory Mitigation Options

State Dangerous Waste

Wastes or environmental media that are designated as dangerous waste must be managed in accordance with applicable regulations. This would require notification to Ecology so that an identification number can be obtained for each location that hazardous waste is generated. Dangerous waste must be shipped off site for proper treatment and/or disposal

within 90 days of the date of generation. Storage longer than 90 days or treatment on site generally requires a permit from Ecology. Obtaining a permit is not usually a viable alternative because of the time and cost required to complete the permit process.

Model Toxics Control Act (MTCA)/Superfund

To the extent that project construction areas coincide with federal Superfund or state MTCA cleanup sites, early coordination with EPA and/or Ecology, respectively, may be necessary to minimize potential project delays. Although the project footprint is within the boundaries of the Commencement Bay Superfund Site, it is not anticipated that WSDOT will impact any of the four specific Project Areas. MTCA is commonly used for upland cleanup work in the Commencement Bay Superfund site boundary, and Ecology will probably assume "lead agency" status of the purpose of this project. Cleanups can likely be accomplished as independent actions by WSDOT, with technical review provided by Ecology on an as-needed basis. Mitigation options to reduce potential construction impacts related to Superfund and MTCA regulations generally revolve around considering alternative construction techniques that minimize or avoid dewatering and excavation activities.

National Pollution Discharge Elimination System (NPDES)

WSDOT should have an overall NPDES construction permit for the entire SR 167 project. Please see the Water Resources Discipline Study for specific requirements under the NPDES permit.

Solid (Non-Dangerous) Waste Disposal

The Tacoma-Pierce County Health Department (TPCHD) regulates the handling of solid waste within Pierce County. TPCHD lists all of the solid waste facilities within Pierce County on the Source Protection program's webpage:
http://www.healthdept.co.pierce.wa.us/sourceprotection/landf.html

The web page lists solid waste facilities for the following categories:

- Municipal Solid Waste Landfills
- Municipal Solid Waste Transfer Stations
- Inert/Demolition Waste Landfills
- Recycling Facilities
- Petroleum Contaminated Soil Treatment Facilities
- Yard Waste/Organic Debris Drop-off Facilities

Staff at TPCHD recommends contacting the appropriate disposal facility to determine what the specific requirements are for that facility. The TPCHD does not need to be contacted prior to disposal at one of the selected facilities.

General Occupational Health Standards (WAC 296-62)

Measures should be taken to limit the exposures of workers and the general public to atmospheres hazardous to human health. Specific mitigation measures are detailed in Mitigation Options for Worker and Public Health and Safety, section 5.6.

Asbestos Containing Materials

The Puget Sound Clean Air Agency should be contacted as soon as possible regarding permitting of abatement. If a survey indicates the existence of ACM in structures to be demolished, a notice of intent is required prior to any work beginning on an asbestos demolition. The federal NESHAP regulation also includes specific notification, work practice, packaging, labeling and disposal requirements.

Underground Storage Tanks

A registered UST site assessor will need to conduct a site assessment/check at the time any regulated UST is removed from the site. Regulated tanks removal regulations include specifics on appropriate notification, closure, and reporting procedures that should be followed throughout the excavation process.

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7.0 Limitations & Signatures

The conclusions in this report are based upon data and information obtained during windshield surveys by WSDOT Environmental Affairs Office personnel to property identified herein and the conditions of the properties on the date of windshield surveys. The interpretations and conclusions obtained in this report are based on expertise and experience of WSDOT Environmental Affairs Office personnel in conducting similar assessments. In assessing the properties, WDSOT Environmental Affairs Office personnel have relied upon representations and information furnished by individuals noted in the report with respect to existing operations and property conditions and the historic uses of the property. Accordingly, WSDOT Environmental Affairs Office cannot be responsible for any deficiency, misstatements, or inaccuracy contained in this report as a result of misstatement, omissions, misrepresentations or fraudulent information provided by the persons interviewed or documentation reviewed.

Work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for assessment of potentially contaminated sites and in accordance with the WSDOT Environmental Procedures Manual M31-11, as accepted by the Federal Highway Administration. This report is not meant to represent a legal opinion. Questions regarding this report and the associated work documented herein should be directed to Allison Ray at (360) 570-6649.

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Allison D. Ray
Hazardous Materials Specialist
WSDOT Environmental Affairs Office
Hazardous Materials/Water Quality Program